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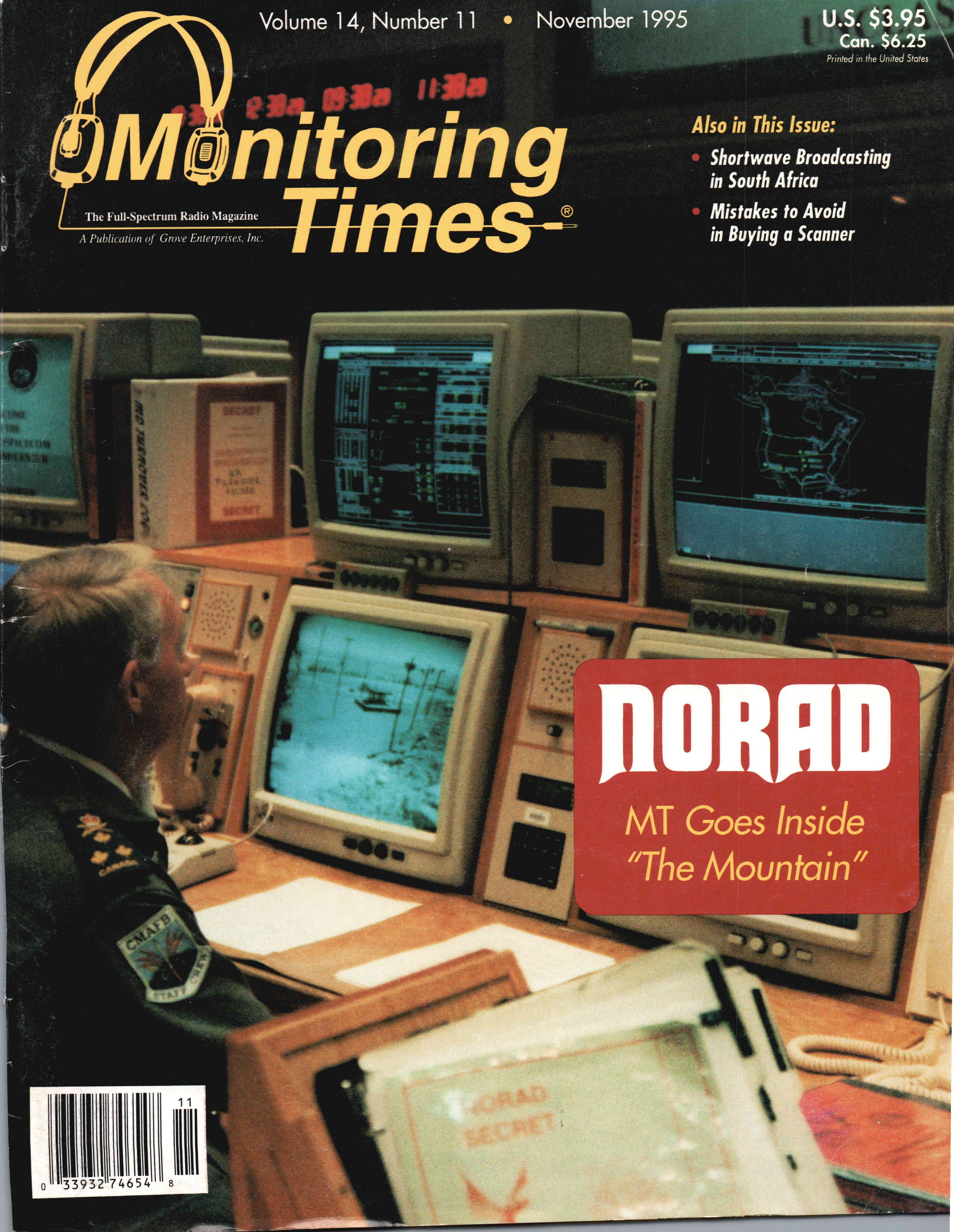
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- Shortwave Broadcasting in South Africa
- Mistakes to Avoid in Buying a Scanner

NORAD

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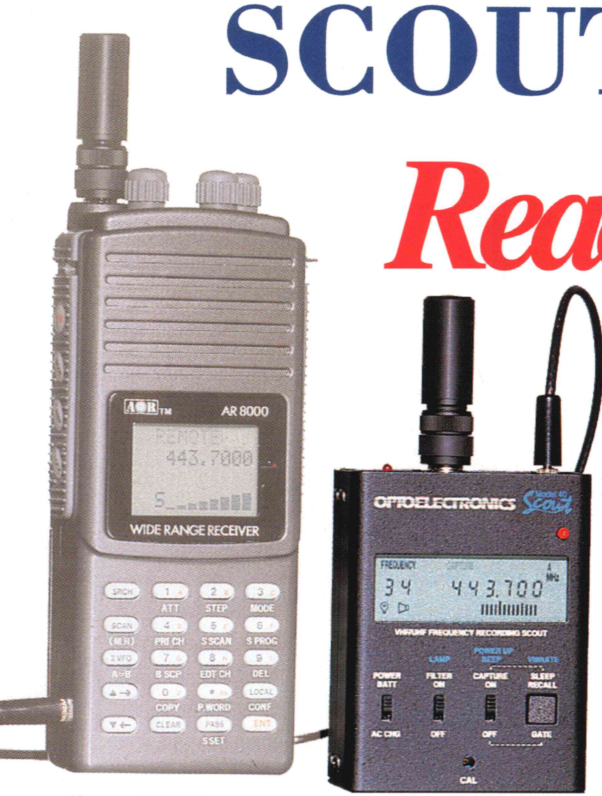
You Won't Miss a Thing With SCOUT™ Reaction Tune



*Scanner not included

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Featuring Automatic Tuning of your AR8000 and AR2700 with the Optoelectronics Exclusive, Reaction Tune (Pat.Pend). Any frequency captured by the Scout will instantly tune the receiver. Imagine the possibilities! End the frustration of seeing two-way communications without being able to pick up the frequency on your portable scanner. Attach the Scout and AR8000/2700 to your belt and capture up to 400 frequencies and 255 hits per frequency. Or mount the Scout and AR8000/2700 in your car and cruise your way into the future of scanning. A simple interface cable will connect you to a whole new dimension of scanning.

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- Automatically tunes these receivers with Reaction Tune (Pat.Pend.) CI-V receivers (ICOM's R7000, R7100, and R9000), (Pro 2005/2006 equipped with OS456, Pro 2035 equipped with OS535) or AOR models (AR2700 and AR8000).
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- DB 32 VHF/UHF mini-antenna shown with Scout (optional)
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At right: Scout shown with CLIPMATE™. A handy windshield mount for Scout, for quick access and visibility.

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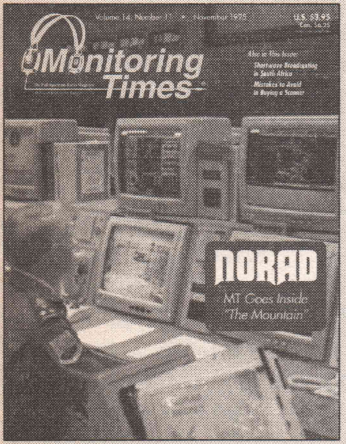

Cover Story

MT Goes Inside "The Mountain"

By Larry Van Horn

The journalists were sufficiently awed. Their cameras and tape recorders had been scrutinized and all the paperwork matched up. After the bus carried them a third of a mile into the granite mountain, they walked through the twenty-five-ton blast doors a mute reminder of the Cold War—and down endless corridors.

Now at last they were in the heart of NORAD (North American Airospace Defense Command).

The focal point of NORAD's huge, information-gathering machine comes down to this seat, today occupied by Lieutenant-General J.D.O'Blenis, Deputy Commander in Chief. (Cover photo by Harry Baughn)

See page 9 for the full tour!

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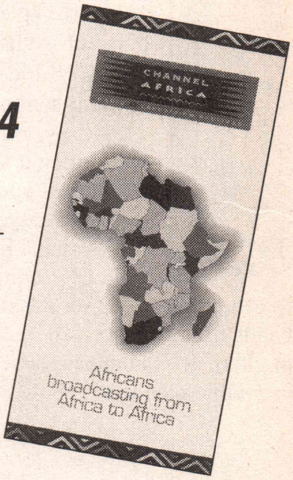
Shortwave Broadcast History in South Africa 14

By Colin Miller

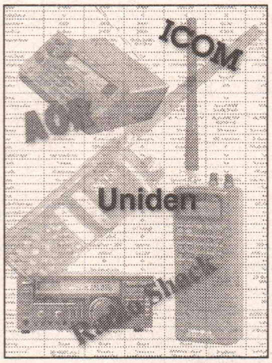

CHANNEL AFRICA
Africans broadcasting from Africa to Africa

Thirty years ago, South Africa's largest transmitter site came on air, but that was by no means the beginning of shortwave broadcasting in this southernmost African country. Shortwave broadcasting today in South Africa has come full circle, again focussing on domestic and continental targets, instead of the global outreach of the 1980's.

Trunked Scanning Laws 20

By Jorge Rodriguez

The law is still being written on the radio monitoring hobby. Though scanning trunked radio systems has generally been assumed to be legal, the Gass case in Oklahoma is setting a new and disturbing precedent. The case is expected to be appealed, but this is one to watch.



15 Mistakes to Avoid in Buying a Scanner 24

By Ed Hesse

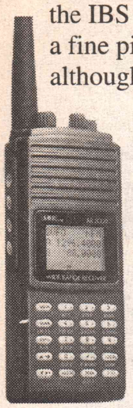
Are you anticipating spending that Christmas money? Avoid disappointment and make an intelligent assessment of your needs before plunking down the bucks.

Modern Receivers: How We got Here from There 28

By John Catalano

The author takes us through the development of shortwave receivers from analog to digital by showcasing one company that has always been at the fore — Collins Radio.

Reviews:



The upgraded Watkins-Johnson HF1000 shortwave receiver is put through its paces by Larry Magne and the IBS team (p.102), who find it a fine piece of machinery, although pricey. On the scanning side, Bob Parnass compares specifications between AOR's AR8000, AR2700, and some other popular scanners (p.104).

Always on the look-out for better antennas, our writers tell you about the L-400B Active Antenna for low band listening from LF Engineering (p.88), the IsoLoop for the shortwave bands from AEA (p.110), and a couple of alternative antennas for your handheld or mobile scanners (p.104).

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MT

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Scanners/CB/Weather Stations

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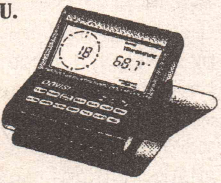

The Weather Monitor II (7440) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC-power adapter, detailed instruction booklet and one year limited factory warranty.

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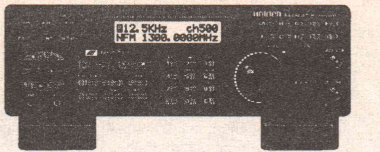

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500 Channels • 20 banks • Alpha numeric display
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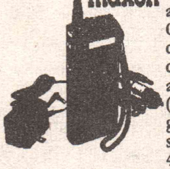
CB/GMRS Radios



The Maxon GMRS 210+3 transceiver is a PLL synthesized 10 channel radio on General Mobile Radio Service frequencies. It's the ideal radio for long range communications. Two repeater channels are programmable and one channel (462.675 MHz.) is set aside for emergency and safety communications. The seven remaining interstitial frequencies 462.5625, 462.5875, 462.6125, 462.6375, 462.6875 & 462.7125 MHz are all-purpose GMRS radio channels. 2 watts of RF power for exceptional transmitting range. Up to 5 watts when used with the supplied 12 volt vehicular DC power cord. CTCSS built-in. Includes 450mAh Ni-cad rechargeable battery pack, AC/DC wall battery charger, owner's manual, FCC license application, belt clip, antenna. Call 1-800-USA-SCAN to order.

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Uniden GRANTXL-U SSB CB Mobile	$139.95
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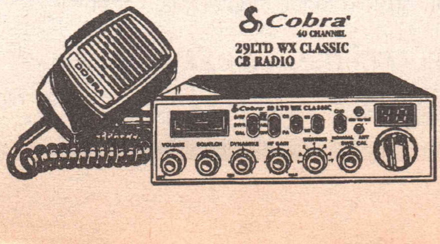

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Thanksgivings

■ The 1995 Grove Expo is now a memory encapsulated in notebooks, frequency lists, new friends, new purchases (and prizes). We are grateful to all the registrants, exhibitors, and speakers who made it such a wonderful event; we'll hit the highlights in *MT* next month.

November is an appropriate time to be giving thanks, and there is no one to whom we owe a greater debt than to the people who make our whole effort worthwhile—you, our loyal readers. In today's changing technology, our primary interest is in continuing to provide you with the tools and the information you most want.

With that in mind, Bill Grove ("son of Bob"), Grove's computer systems manager, will be editing "Net News": a column dedicated to news and tutorials on using the Internet, which is itself both a medium of communication and a tool to locate more information. Wayne Mishler, a former feature writer for *MT* and a columnist for *Satellite Times*, will be keeping us up-to-date on other emerging wireless communications technologies such as personal communications systems (PCS) in a column to begin in January. Please lend these new staff writers your support with your news clippings and letters.

We'd like to know, as 1996 progresses, whether these columns meet your needs for keeping up with new developments. Conversely, are inexpensive, low-tech listening solutions adequately covered by current columns, or would you like to see a column devoted to it as well?

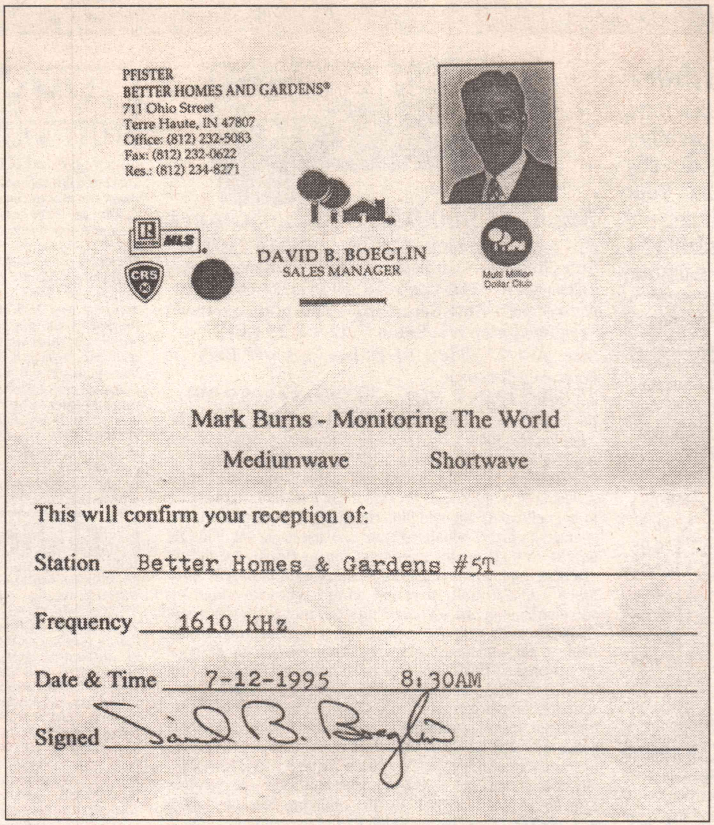
Surveys are great for providing such feedback, but they are also expensive. As the radio hobby goes through a time of transition, however, we need to know how we are doing. What do you like?; what don't you like?; what would you like to see that we don't cover? We are always glad to hear from you. Please write to MT Editor, PO Box 98, Brasstown, NC 28904, or e-mail to **mteditor@grove.net.** And now to your letters ...

Real Estate Radio

■ B.W. Battin's August article on low-powered AM transmitters coupled with an audio loop to sell real etate aroused a lot of interest, as we expected it would. However, the Florida franchise business referenced in his article does not appear to be a reliable source, especially for those wanting to buy only a few.

We have tracked down the company which almost certainly supplied the Florida business with their radios. The product, called Talking House®, has already proven its longevity, and apparently is now "the only game in town." We had a delightful talk with the folks at Realty Electronics in Fond du Lac, Wisconsin, and will cover their product in "What's New?" as soon as we receive their brochure. If you can't wait, you can call for information and pricing at 1-800-444-TALK.

B.W. sent us a letter he received from Mark Burns, who monitored a local real estate agency, Pfister & Co. in Terre Haute, Indiana, using the Talking House transmitter. Mark says, "One morning, I tuned in and heard one located 7 tenths of a mile from my home. I got a crazy hair and sent in a taped reception report along with a PFC. Two weeks later, my QSL arrived in the mail. What a hobby!"



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Signed David B. Boeglin

QSL from a Terre Haute, Indiana, real estate company using the Talking House transmitter.

The FCC: Defender of the People?

■ Bob Grove's "Closing Comments" in this issue agrees with some sentiments expressed in an earlier letter from Randy Underhill of Pinckney, Michigan. Randy says, "I wonder, do the readers ... understand what might happen to us by losing the FCC or down-sizing it? Do the readers realize a new group in charge might dislike scanning and ham radio even less?

"Do they realize we have already lost control of the media and letting these big mergers go on without a fight will only hurt us more in the end? These big mergers will doom us to even more controlled snooze output. Do the readers know these corporations can own three FM stations and one TV station in the same market?

"Am I the only one thinking this? Am I the only one complaining to Congress with calls and letters? I hope not. Did anyone pay attention to the May '94 item (*MT* page 6) on how Ohio Representative Michael Oxley wants to allow foreign ownership of our U.S. broadcast media? There's legislation in Washington right now on some of these very subjects also.

"I believe the FCC needs to be jump-started, but at least they are familiar with the hobby end of it. The FCC needs our input also. We need to reclaim our radio and TV spectrum. The FCC should be controlled by the people."

Canadian Railway Radio

■ Bruce Matthews of Calgary, Alberta, writes, "In response to the question asked by Howard Box of Tennessee about CNN in the August 'Letters,' there were a series of stations set up by the Canadian National Railway in the late twenties or early thirties to broadcast to passenger trains between Montreal and Vancouver via Winnipeg, Saskatoon, and Edmonton. They all had callsigns using CN(x).

"At the formation of the CBC, these stations became part of the original CBC AM domestic network. The *N* was changed to *B* and this is why, I believe, some CBC stations still only have three call letters. For example, *CNR* became *CBR* 1010 here in Calgary.

"With this information to start with, a better-equipped researcher should have no difficulty determining the start and dates for the other stations on the network. (The above

(Continued on Page 114)

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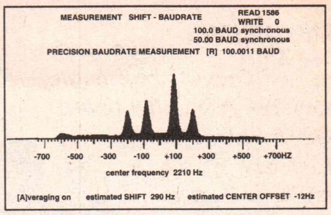

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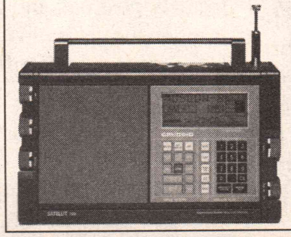

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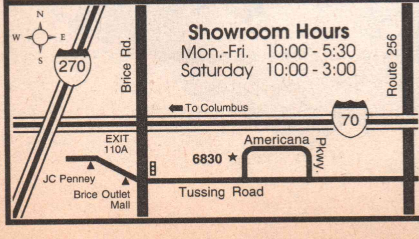

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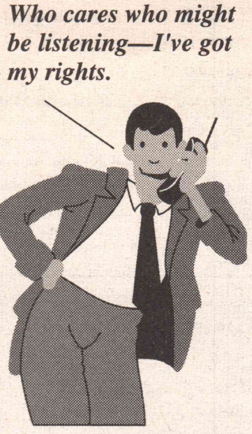

Who cares who might be listening—I've got my rights.

■ A Florida man, charged with plotting to kill his stepson after a neighbor taped his incriminating cordless phone calls, may walk free because of a Supreme Court ruling. In April, the Florida Supreme Court ruled that cordless phone users have an expectation of privacy, giving Michael Von Smith some legal ground to stand on.

Smith's attorney asked the court to suppress the tape of the call and all testimony related to it. Judge Diana M. Allen agreed and ruled in Smith's favor. Assistant State's Attorney Dan McClain says the case is not over, however. The ruling does not affect other conversations between Smith and alleged hit man Bradley McNeil.

"It's weaker than it was, but there is still a case there," said McClain.

We're From Washington and We're Here to Help...

■ When KTOZ went bankrupt, Springfield, Missouri, lost the only station in town that played popular standards. Not content to let it go at that, nineteen listeners came together to form a corporation and reopen the station.

Not only did they reopen the 500 watt AM daytime-only station, but they became its staff as well. All shareholders hold other jobs and none is paid for their work at the KTOZ. It's a labor of love and it's paying off. "When we bought the station," said 57-year-old Ron Johnson, "it was 26th out of 26 in the market. Now we're 12th."

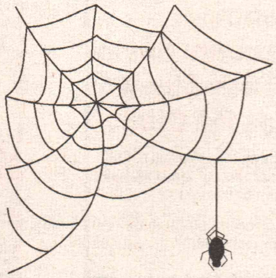
There's a small problem, however. The Labor Department says that a for-profit business cannot legally be run by volunteer labor. The station may be ordered to pay back wages to the staff. "Our freedoms are being chipped away," said Johnson. The next move is up to the Labor Department; meanwhile, the station continues to broadcast.

Nazi Radio 卐

■ Danish authorities are powerless to stop a neo-Nazi radio station that will soon begin broadcasting from Denmark. Danish Nazis are said to be constructing an extensive communications center just outside of Copenhagen, complete with "powerful computers which will provide access to international communications networks, with a printing center, an open telephone line and soon its own radio station."

The Nazis chose Denmark as the ideal country in which to build their European headquarters, because of its central location and liberal feelings toward racism. The new station will be called Radio Oasen (Radio Oasis) and will initially broadcast Nazi rock and social debates for six hours each day. Danish Nazis consist of a hard core of 150 people, but include over 2500 supporters.

Net Radio



■ A quarter of a million listeners from 140 countries are tuning in to the Internet Multicasting Service, a cyberstation in operation since 1993. Just about anyone with a multimedia or equivalent PC can access the station and download audio files. For live listening, a network capable of 64 kbps is required.

The Internet cyberstation is not regulated by the FCC, but it does license much of its material, such as audio from World Radio Network and live links from Congress. Original productions can be found, too, such as "Geek of the Week," a half hour interview with computer nerds. "We're not just radio on the net," said founder Carl Malamud. "This is a multiprotocol, multidata, multimedia thing, and so we use audio and video and images and text, and we make it available using anything from downloading from CS to live for whatever is on your desk."

The response to the station has been extremely positive, and the need for more stations on the net is obvious, said Malamud. To learn more, e-mail **info@radio.com**.

High-Tech Pagers

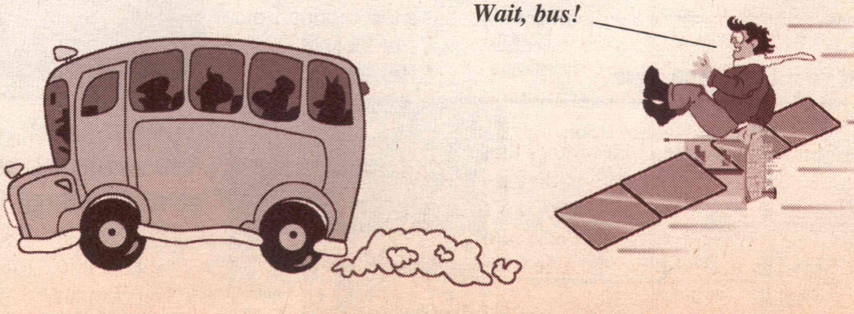
■ Law enforcement officers conducting electronic surveillance of pager traffic may run into a snag shortly, due to a new technology called FLEX. The new pager protocol, introduced by Motorola in late 1994, is a high speed format code which receives at 1600, 3200, and 6400 bps and is expected to replace the standard POCSAG now being used. The protocol allows pagers to display both letters and numbers via digital data burst and up to 2,000 characters will be receivable by some units.

Police departments are not yet equipped with the means to decode FLEX data and it is feared that criminals using these pagers will escape electronic surveillance. Luckily, an Illinois company is manufacturing a $6,000 unit for real time monitoring of FLEX pages. Advanced Signal says that the unit will receive not only FLEX but POCSAG, GOLAY, and NEC/D3. "If FLEX becomes the new technology," said Capt. Jerry Metz of the Bay County, Florida, Sheriff's Joint Narcotics Task Force, "We will have no choice except to upgrade our interception methods."

Catching the Bus by Satellite

■ RATP, Paris' transportation company, recently initiated a satellite communications system to monitor the whereabouts of all buses operating on its busiest route. The system, called ALTAIR, is used on the north-south Route 47 that runs from Gare du Nord to Kremlin Bicetre. Information from the buses is communicated to the district control office and to LCD's at bus stops along the route.

ALTAIR is based on the use of 24 GPS satellites orbiting 16,000 miles above earth. Using triangulation, they pinpoint each bus to within 33 feet. Drivers, passengers, and those waiting for buses are updated constantly as to location and time of arrival of the vehicles. The city of Paris is evaluating ALTAIR for possible use by all 260 RATP bus lines.



Now what did that MT *article say about some new signalling device?*

Soldier 911

■ Air Force Captain Scott O'Grady spent more time than he had to on the ground in enemy territory after being shot down over Bosnia. The F-16 pilot would have been rescued quicker had he had access to a new military device called "Soldier 911."

The handheld radio weighs only 2-1/4 pounds and is designed to let a solider send out an emergency satellite signal without speaking. Lt. Col. Robert W. Kocher with the Pentagon's Advanced Research Projects Agency, said that if a soldier or airman is in distress, the device will "give you his exact location to within a distance of 16 yards."

Soldier 911 is now being field-tested by the 3rd Battalion, 12th Infantry Regiment of the US Army's 1st Armored Division, who are part of a UN peacekeeping force in Bosnia.

Radio Saves Man Buried Alive

■ A Montgomery County, Washington, man is more than lucky to be alive after he was buried under a pile of trash at the local dump. The 48-year-old man, an employee at the dump, was accidently buried by a front-end loader that had dropped its load on him. He remained buried for more than an hour before he used his two-way radio to call co-workers for help. The county Collapse Rescue Team responded and freed the man. He was taken to a hospital, treated and released.

Undercover Crook

■ Police in Oxnard, California, are on the lookout for a man who uses a scanner in his low-life escapades. See if you can follow this.

Apparently, the man, posing as an undercover cop, enters a business (let's say, a donut shop), saying that he had heard about an earlier disturbance at the store and had just come by to check on things. He walks behind the counter, asks the clerk a few questions, then excuses himself to go outside for a minute to have a cigarette.

A few minutes later the clerk notices that the cash register has been hit. When they go outside to tell the undercover "cop," he's gone. [Real] Sheriff's Sgt. Keith Lazz said that "the guy was listening to a scanner. He hears there's a problem and he goes there to take advantage of it."

What Next?

■ Virginia's Contel Cellular thought that they had heard it all in reference to the dangers of cellular radiation, but a new one has emerged. Residents in the 38th Street area of Richmond are worried about a cellular antenna near a city dump that may release methane gas.

Councilwoman L. Shirley Harvey says that she is worried but, "we don't know if the methane gas may have a problem. We don't know what will mix with the power lines."

Jeff Keller, Contel Cellular's director of communications, replied that, "I've never heard that issue raised before and I've not read anything where that's considered a health risk." Residents will meet to talk about the possible problem.

USCG Station Shutdown

■ The United States Coast Guard is expected to close its Marshfield, Massachusetts, station next year after 52 years of continuous operation. The Marshfield station provides communications for Coast Guard and private vessels on the high seas. The receivers, antennas, and other equipment will be moved to Otis Air National Guard Base in Bourne, and 20-25 Coast Guardsmen will be reassigned there to maintain the equipment.

"There will no loss of services...everything we do will be done remotely," said LCDR Kurt Guth, the station's commanding officer. Operations at Marshfield include fax weather bulletins and navigation information as well as monitoring of distress calls from vessels at sea. Marshfield is expected to complete the transition to full automation by July 1996.

Detroit Strikers Use Radio

■ Seven newspaper union picketers in the Detroit suburb of Farmington Hills were arrested for conspiracy to maliciously destroy property. The seven men patrolled the streets in three cars, carrying baseball bats and nails used to puncture vehicle tires. They coordinated their activities using Motorola two-way radios. Police officers stopped one of the vehicles and during the search heard the radio in use.

"Someone was calling for car six," Police Chief William Dwyer said. "The officer found the radio and discovered that it had a number six written on it, so he got on the radio and told them he was car six."

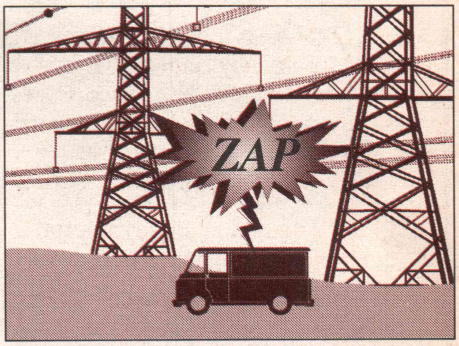
The officer arranged to meet the other vehicles, which resulted in a total of seven arrests. The picketer violence resulted when nearly 2,500 employees of two Detroit newspapers went on strike.

Ouch!

■ A Fort Myers, Florida, news crew sustained second and third degree burns when their news van tower contacted an overhead power line.

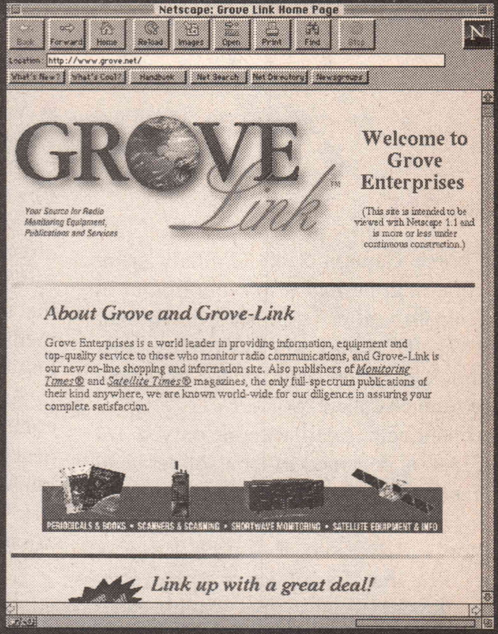
WINK-TV reporter Valerie Vance and photographer Daniel Nelson had been sent out to cover early morning flooding in Sarasota County when they became part of the story themselves. As they set up and raised the hydraulic tower in preparation for transmitting a live shot back to the studio, the metal mast of the tower touched a 7,000 volt power line. Both Vance and Nelson were thrown twenty feet as they stepped from the van.

Lt. William Stookey of the Sarasota County Sheriff's Office said that Vance was knocked about twenty feet and Nelson was shocked himself when he ran to her aid. "As long as they were in the van, there would not be a ground because of the rubber tires," he said. Vance and Nelson were in critical condition, but the injuries were not expected to be life-threatening.



"Communcations" is written by Larry Miller with help from Laura Quarantiello, Rachel Baughn, and the following readers who are hereby officially inducted into this month's Communications Monitoring Team: Ron Bruckman, Hampstead, MD; Jack McCartan, Newark, DE; Bob Fraser, Cohasset, MA; Ira Paul, Royal Oak, MI; Michael J. Sandor, Monroe, NY; Mike Reynolds, Tulsa, OK; Phillip A. Roberts, Jr., Chesterfield, VA; Doug Robertson, Oxnard, CA; Robert E. Thomas II, Bridgeport, CT; and John Ward, Brandon, FL. Special thanks to all the regulars! We also consulted the following publications which yielded helpful information: *BBC World Broadcast Information, National Scanning* and *Radio World*.

No Matter Where in the World You Are, We're Just a Click Away.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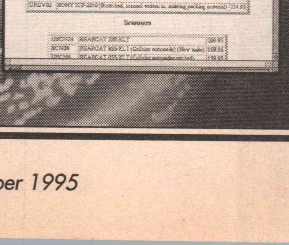

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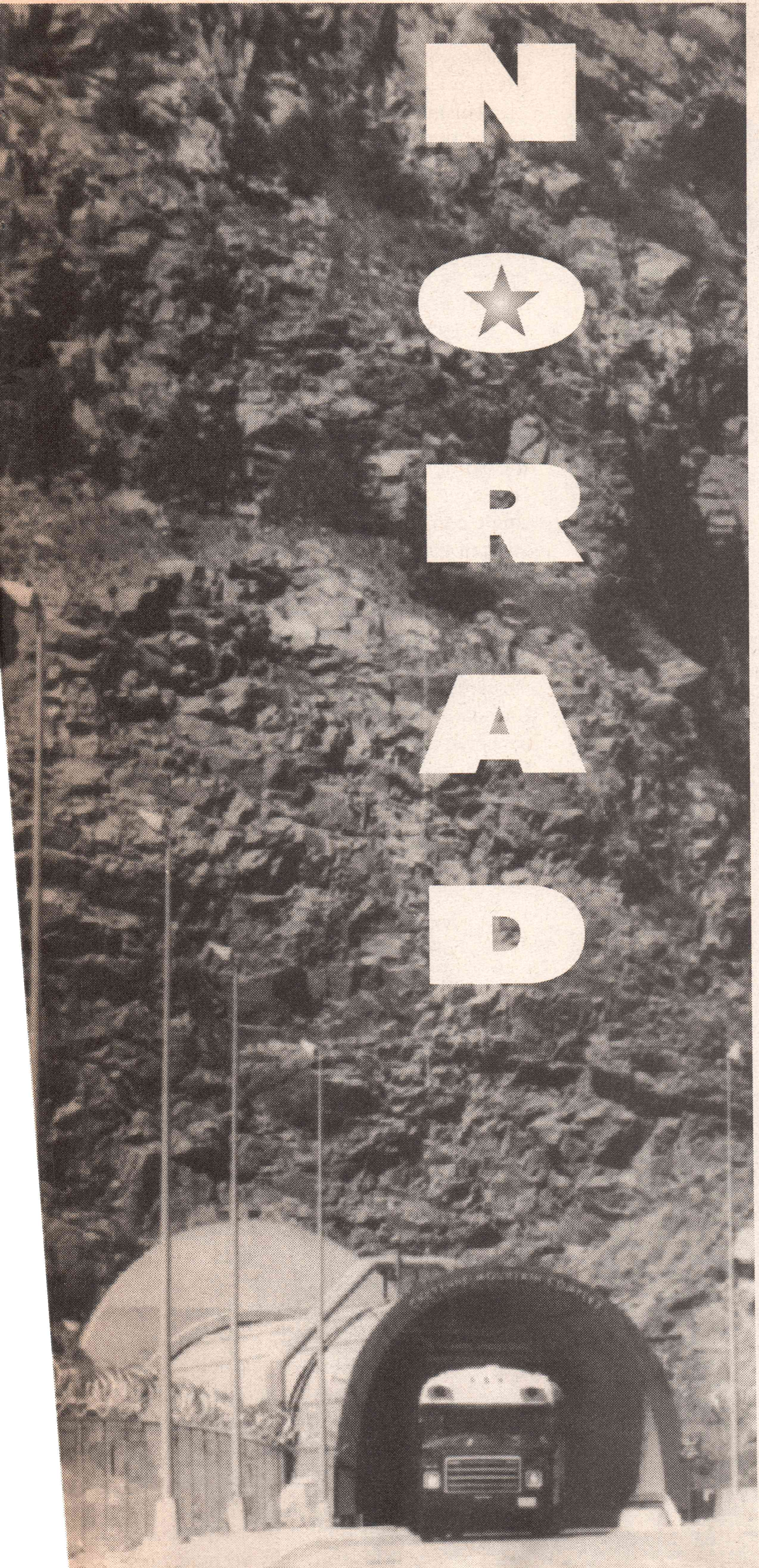


Security in this nuclear-hardened, joint US-Canadian defense facility is extremely tight.

Photo by Harry Baughn

MT *Takes a Look Inside Cheyenne Mountain*

Photo by Harry Baughn

By Larry Van Horn

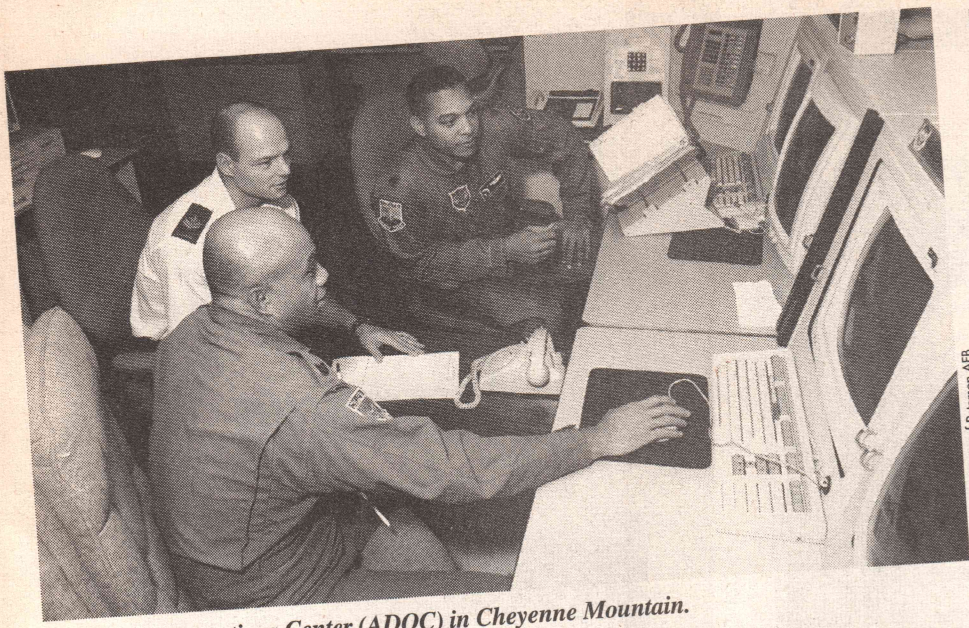
Nothing seemed out of the ordinary. It was just another day at the office. A tour group was in the command center briefing room with their Air Force military escort. They were being briefed on how NORAD performs their mission. Just in front of them was a large glass window that separated the tour group from the room where blue-jump-suited military personnel were watching their computer displays. These personnel comprised the heart of the operation — the NORAD/ U.S. Space Command (USSPACECOM) Command Center.

Suddenly audio and visual alarms went off inside the Command Center and curtains draped at the sides of the large glass window started to close. The public tour in the briefing room was immediately escorted out of the complex by their tour guide with no explanation of what was happening.

"Command Director, this is Missiles. We have a quick alert off of Plesetsk."

Moments later, "Command Director, this is Intelligence — we believe this is the test ICBM launch we were notified about. Stand by for further."

By now, Missiles (the Missile Warning Center) has picked up the operations loop, put the voice connectivity together, and everyone else in the mountain picks up on the event. Emergency action controllers along the outside wall of the Command Center established communications with various other command organizations outside the mountain, including the National Command Authority (NCA) in Ottawa and Washington.



USAF photo courtesy of Peterson AFB

Air Defense Operations Center (ADOC) in Cheyenne Mountain.

As additional data was received from the Pacific Defense Support Program (DSP) satellite, computers send updates to the display consoles indicating the possible flight path of the Russian missile. A fan-shaped symbol, also known as the "Fly Swatter," was superimposed on the world map on the Granite Sentry system displays, indicating the flight path of the missile and potential impact areas.

As the missile continued to burn, the DSP satellite continued to gather infrared signature data and compare it with information in the processor's database. As more information was fed into the computers another round of alarms was triggered.

"Command Director, this is Missiles — we have a missile event from Plesetsk, azimuth 65 degrees; this is an SS-19 ICBM missile test."

At this point, a scrub of all the data in the computers was conducted to make sure this was a real event. Then the Command Director picks up two handsets (one for Ottawa and the other for Washington, D.C.) and announces:

"All stations, this is the NORAD Command Director. High speed data is valid; we have an SS-19 ICBM test launch from Plesetsk, azimuth 65 degrees, heading for an impact on the Kamchatka peninsula. CINCNORAD's assessment is this is not a threat to North America. Any questions?"

Yes, it was just another day at the office for the men and women of NORAD — the North American Aerospace Defense Command in Cheyenne Mountain.

Monitoring Times editor Rachel Baughn, Utility World columnist Larry Van Horn, and staff photographer Harry Baughn recently had the opportunity to travel to Colorado Springs to take an inside look at what goes on, deep within this 9,500-foot-high granite mountain.

Photo by Harry Baughn

These are some of the eyes and ears which bring the outside world to the Mountain.

Background

President Franklin D. Roosevelt and Prime Minister Mackenzie King issued the "Ogdensburg Declaration" in August 1940. It voiced the concept of joint defense. At the end of World War II, collective security for continental defense remained of vital interest to both nations. Ottawa and Washington announced in February 1947 the principles of future military cooperation which included consultation on air defense issues.

In 1954, Royal Canadian Air Force (RCAF) Chief of Staff, Air Marshall C. Roy Slemon, and General Earle E. Partridge, head of the U.S. Air Force Air Defense Command, discussed ways to provide the best defense for North America. Their plan called for a combined air defense organization under a single commander. This plan led to the creation of the North American Aerospace Defense Command (NORAD).

The agreement, signed by the two governments May 12, 1958, set NORAD as the first and only successful binational command. In the agreement between the United States and Canada, NORAD provides a framework for cooperative defense planning and operations between both governments for the defense of North America.

NORAD's Mission

NORAD is responsible to the heads of both governments for surveillance and control of the airspace of Canada and the United States; warning and assessment of an aerospace attack on North America; and, providing an appropriate response should deterrence fail.

For control of its airspace, NORAD maintains an extensive series of radars throughout the U.S. and Canada which provide coverage of all approaches to North America. Additionally, the commander in chief (CINC), who is also the Commander of U.S. and Air Force Space Commands, has access to a wide array of space-borne sensors capable of detecting and tracking missile launches from anywhere in the world, and following the track of aircraft suspected of smuggling illegal drugs into North America.

To accomplish its warning and assessment role, NORAD maintains an integrated tactical warning and assessment (ITW/AA) system. With information from ground-based and space-based sensors, CINCNORAD can provide timely, reliable, and unambiguous warning of any attack against North America.

According to NORAD officials, in 1991 NORAD tracked over 600 missile launches, with the rate settling down to over 200 a year during the period 1992-1994. With the proliferation of ballistic missile technology, that number could increase dramatically in the future.

NORAD's response capability is provided by a network of alert fighters along the periphery of North America. U.S. F-15s and F-16s and Canadian F-18s stand ready to intercept and, if necessary, engage any air breathing (airborne) threat to the continent.

■ The People Make It Work

"The team (the people), the connectivity, and the processes—are the most important part of this whole operation," according to Lt. Gen J.D. O'Blenis. Gen O'Blenis is the Deputy CINC NORAD and was command director the day that the *MT* staff visited Cheyenne Mountain.

"It doesn't have to be at Cheyenne Mountain," said Gen. O'Blenis of the underground command center. "We are here in Cheyenne Mountain by accident. We were here during the early part of the Cold War to be able to withstand a missile attack. The Cold War is over, and we couldn't withstand an attack now anyway because of the accuracy of modern missiles. We are here because it is the cheapest place to be right now and we have been here for a long time."

DSP satellites play an indispensible role in modern defense.

■ Inside the Mountain

Cheyenne Mountain serves as a central collection and coordination facility for a worldwide system of sensors designed to provide the CINC NORAD and the National Command Authorities of the U.S. and Canada an accurate picture of any aerospace threat. CINC NORAD maintains his headquarters at Peterson AFB, Colorado, and his hardened command and control center is located a short distance away at the Cheyenne Mountain Air Station.

The best way to describe the operation in Cheyenne Mountain is to think of a six-spoked wheel. Each spoke or command center has a specific responsibility to feed various types of information to the wheel hub (the Command Director) in the command center. All of this information is used to help the NORAD command director answer the fundamental question: "Is North America under attack?"

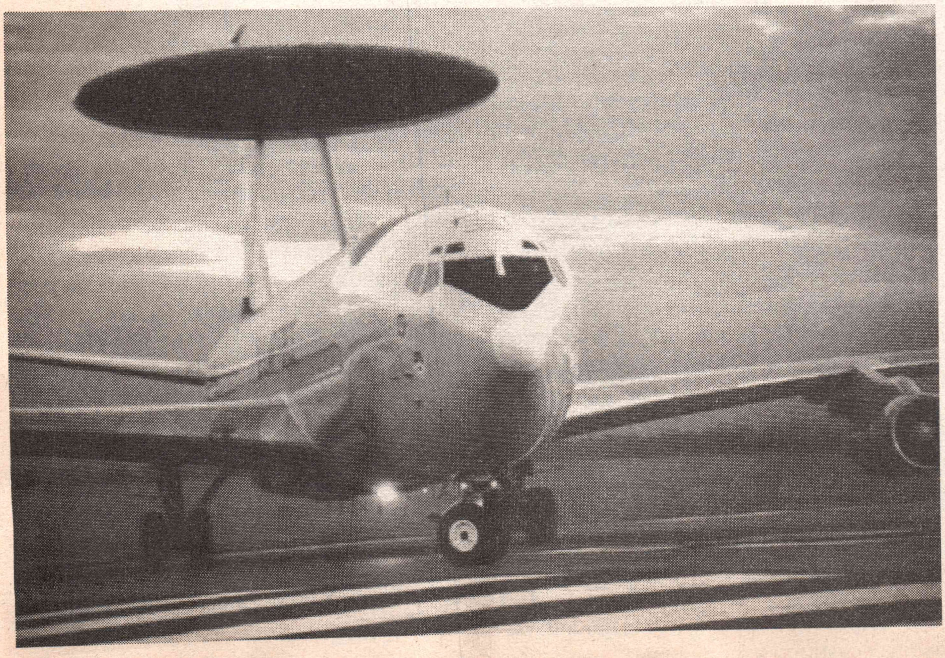
The first of these spokes is the **Missile Warning Center (MWC)** which processes ballistic missile events. It is responsible for providing surveillance and ballistic missile attack warning data to NORAD, and warning of ballistic missile attack to commanders-in-chief worldwide. The MWC is the terminus for the Missile Warning Network, a worldwide network comprised of sophisticated space-based (e.g.. DSP satellites) and land-based sensors (e.g.. Pave Paws radar) used to detect and track ICBMs, SLBMs, manned bombers, and cruise missiles anywhere in the world.

Gen O'Blenis pointed out that the DSP system was designed to detect large missiles; consequently, the U.S. has decided to build a replacement system called SBIR (Space Based Infrared) which will supplant the DSP satellites. SBIR is a whole new technology—a steering technology versus a sweeping technology. The reason for building a new system is the deficiency in the DSP's ability to see very small missiles. Such missiles are not necessarily less powerful or of shorter range, but missiles are becoming more efficient and will be even more so in ten years.

The newer missiles burn cooler and shorter. They will have more efficient propulsion systems. The intention behind SBIR is to keep up with such developments. During the Gulf War, we saw all the Scud missiles fired by Iraq, but we were getting very close to the threshold. If there had been a lot of cloud cover we might not have seen them, because some of the burn might have been masked by the moisture in the air. It is possible that a Scud missile, launched in the right place at the right time, would not show up on NORAD's systems.

Meanwhile, we now have a tactical event system that U.S. Space Command put together which uses modern processors to build stereo pictures. It is designed to enable the DSP satellites to see the smaller missiles. Using better software on the same data, it is possible to get a better product.

The next spoke in the wheel is the **Air Defense Operations Center (ADOC)** which works closely with its three subordinate re-



USAF photo

USAF AWACS aircraft taxi to the runway.

TABLE 1 — NORAD UHF Air Intercept Frequencies

(All frequencies in MHz)

Western Air Defense SOCC: McChord AFB, Washington
Remote Sites: Mt. Lemmon, AZ; Crescent City, CA; Mill Valley, CA; Mt. Laguna, CA; Paso Robles, CA; Point Arena, CA; San Clemente, CA; Vandenburg, CA; Brushey Mtn, NM, CA; Kalispell, MT; Malstrom, MT; Roy, MT; Finley, ND; Watford City, ND; Keno, OR; Salem, OR; El Paso, TX; Ellington, TX; Laughlin, TX; Odessa, TX; Oilton, TX; Makah, WA; McChord, WA; and Mica Peak, WA.

228.6	228.9	234.6	235.9	238.4	239.7	252.0	254.2	260.8
265.4	267.0	270.2	271.0	274.4	277.6	281.6	282.6	288.4
298.1	309.4	316.3	320.6	324.0	327.9	328.0	336.6	341.8
346.2	348.2	351.5	355.2	359.8	374.0	377.0	386.0	387.8
390.2	394.2	397.8	398.0					

Southeast Air Defense SOCC: Tyndall AFB, Florida
Remote Sites: Cross City, FL; Ft. Lonesome, FL; Key West, FL; Patrick, FL; Richmond, FL; Tyndall, FL; Whitehorse Field, FL; Lake Charles, LA; Slidell, LA; Fort Fisher, NC; Jedburg, SC; Ellington, TX; Oilton, TX; and Oceana, VA.

228.8	234.7	238.5	251.0	256.6	263.2	270.4	275.0	278.6
292.7	298.5	302.4	306.4	325.5	338.4	344.0	356.0	369.0
375.1	386.2	392.8						

Alaskian Air Defense ROCC; Elmendorf AFB, Alaska
Remote Sites: Barter Island, AK; Cape Lisburne, AK; Cape Newenham, AK; Cape Romanzof, AK; Cold Bay, AK; Elmendorf, Ak; Ft. Yukon, AK; Galena, AK; Indian Mtn, AK; Kotzebue, AK; King Salmon, AK; Murphy Dome. AK; Oliktok, AK; Pt. Barrow, AK; Pt. Lay, AK; Sparrevohn, AK; Tatalina, AK; and Tin City, AK.

229.1	238.4	240.2	254.5	254.6	261.6	261.7	262.4	264.4
269.9	278.0	287.5	288.4	292.0	293.2	297.6	297.8	315.4
325.0	325.8	364.2	397.8					

Northeast Air Defense SOCC: Griffiss AFB, New York
Remote Sites: North Truro, MA; Buck's Harbor, ME; Empire, MI; Wurstmith, MI; Nashwauk, MN; McGuire, NJ; Lockport, NY; Remsen, NY; Riverhead, NY; Sanborn, NY; Suffolk Co, NY; and Utica, NY.

228.7	228.8	229.1	233.6	235.8	239.2	239.4	251.8	258.0
273.4	278.2	278.4	282.5	284.8	292.4	292.8	293.6	297.7
298.8	303.9	309.5	312.8	316.2	318.1	318.4	326.4	327.2
338.8	342.1	347.4	348.8	351.6	357.1	371.0	371.8	376.2
379.0	384.0	389.2	394.8	396.8	399.0			

Miscellaneous Alert/Air Defense Frequencies:

148.125	276.4	276.65	279.4	285.9	298.3	397.25	

Canadian Dewline ATC frequency: 123.550

gions to maintain a clear picture of the "air breathing" (aircraft and cruise missiles) threat. The three NORAD regional headquarters are located at Elmendorf AFB, Alaska (Alaska NORAD Region, ANR); North Bay, Ontario (Canada NORAD Region, CANR); and Tyndall AFB, Florida (Continental U.S. NORAD Region, CONR). These three regional operations centers receive direction from CINC NORAD and control operations within their respective areas of responsibility.

The Canadian and CONUS (Continental U.S.) regions are further subdivided into NORAD sectors, each supported by a sector operations control center (SOCC). The Canadian NORAD Region Headquarters and two SOCC's — one for the Canada East Sector (callsign Sidecar) and the other for the Canada West Sector — are collocated in an underground complex 600 feet below Canadian Forces Base in North Bay.

The CONUS NORAD Region consist of three SOCC's: the Western SOCC at McChord AFB near Tacoma, Washington (callsign Big Foot/Deer Hunter); the Southeast SOCC at Tyndall AFB near Panama City, Florida (callsign Oak Grove); and the Northeast SOCC at Griffiss AFB, Rome, New York (callsign Huntress/Northern Lights).

A network of more than 90 long-range radars in the U.S., Canada, and Alaska provides air defense surveillance data to the SOCC's and regional command centers. NORAD fighter alert forces are under operational control of the sectors to perform the air sovereignty intercept mission and to defend against hostile aircraft and cruise missiles if necessary.

The SOCC's use a sophisticated series of UHF remote stations along the U.S. and Canadian coastlines to communicate with their interceptor fleet of aircraft. A list of these remotes and their frequencies can be found in Table 1.

These armed interceptors are on 24-hour alert at several locations around the continent. NORAD alert fighters identify unknown aircraft, some of which may be Soviet bombers probing North American air defenses or passing through air defense identification zones. The fighters help NORAD distinguish between a civil aircraft which may have strayed off course and a hostile bomber or cruise missile that could be attacking North America.

These fighter crews stand ready round-the-clock for the identification mission, to monitor suspected aerial drug traffickers, and to assist aircraft in distress or escort special interest aircraft in the NORAD area. Many more fighters can be made available at higher states of alert. These include aircraft from the U.S. Air Force and Air National Guard training units, U.S. Marine Corps, U.S. Navy, and the Canadian Forces Fighter Group. Strict rules of engagement prevail, and in over 35 years of operation NORAD fighters have never fired upon another aircraft.

NORAD interceptor forces consist of:

—F-15 Eagle and Canadian CF-18 Hornet fighters. Both aircraft have excellent radar and armament for bomber and cruise missile threats.

—F-16 Fighting Falcon that replaced F-106s and the F-4s of the U.S. Air National Guard.

To support the interceptors, CINC NORAD can draw on E-3 Airborne Warning and Control System (AWACS) aircraft for additional radar coverage of the North American continent. These AWACS aircraft are all part of the 552nd Operations Group based out of Tinker AFB in Oklahoma. AWACS squadrons of the 552nd consist of the 963, 964, 965 and 966th Air Control Squadron.

NORAD can also draw on Air Mobility Command and Canadian Air Command tankers to increase the range and endurance of the interceptors. A list of HF backup frequencies and UHF frequencies for AWACS communications can be found in Table 2.

The next center that provides input into the hub is the **Space Control Center (SCC)**. It is responsible for maintaining the overall picture of space activity. The SCC detects, tracks, catalogs, and identifies all man-made objects orbiting the earth. The center is the terminus for the Space Surveillance network which is composed of radars, telescopes, cameras, and radio receivers.

This worldwide network of sensors makes 30,000 to 50,000 observations a day. The center is currently tracking about 7,050 space objects orbiting the earth. SCC is also the operations center for space control, and is responsible for protecting U.S. and Allied space systems by monitoring space and space-related activity, and informing members of the space community of pertinent events.

Gen. O'Blenis pointed out in our briefing that objects on orbit do not change very rapidly. "The laws of physics keep spacecraft in the same orbit unless they maneuver — and we don't see them all the time. We see them for a little bit, then we see them for a little bit, then we see them for a little bit again; then we put that together to make a model. Space track is not like a radar track of an airplane. Radar beats on an aircraft and it is updated continuously. With a space track, you have your sensors on the ground, and as the object passes over you take a shot, then another shot, then another shot. Then you put that together and you build a computer model and the computer model tells you where everything is all the time. So you aren't actually going to see it all the time."

The **Weather Center (WC)** advises the command center about atmospheric weather at sensor sites as well as solar activity. NORAD uses satellite communications extensively, which can be adversely affected by sunspots and solar flares. Geomagnetic activity is also monitored in order to differentiate between real world events and weather-related phenomena.

USAF photo courtesy of Peterson AFB

Space Control Center (SCC) in Cheyenne Mountain.

TABLE 2
NORAD HF Frequencies

(All frequencies in kHz)

Voice Coordination Nets (USAF):
4721 6735 6750 8967 9023
11214 13207 18027

Datalink Frequencies (USAF):
2624 2644 3384 5171 6131
6136 6940 6947 10194 10895
11007.5 11016 11740 13670 14364
23271

Miscellaneous USAF Air Defense Frequencies:
4772 4865

U.S. Navy Air Defense Frequencies:
3151 4721 4738.5 5718 5804

6723 6735 6745.5 6750 8967
9001 9014 9023 11214 11256.5
13207 13225.5 15026 18027 23271

NORAD Rapier Teams:
6795 6834.5 10280 10647 15715
18532 20870 20873 26818 26910

The **Systems Center (SC)** monitors the configuration of close to 100 on-line computer systems in the complex. This center is also responsible to monitor the environmental systems maintained within the complex (e.g. air quality, water purity, status of electrical power generation, etc.)

Finally, the **Intelligence Center** (IC) is a joint NORAD/USSPACECOM agency and one of the 11 primary centers in the DoD Indications and Warning (I&W) Systems. It provides to the Command Center expert and timely intelligence data as well as to the Commander in Chief NORAD and his senior advisers.

There was one important thing that made a lasting impression on the *MT* staff during our visit to "The Mountain." To some it is just a 100 million-year-old, hollowed-out mountain at the eastern edge of the continental divide with a lot of fancy equipment in it. But this special place is more than that. All of the hardware at NORAD's command would be useless without the people to operate it. As we saw and heard in each of the various command centers we visited, the most precious resource is not the granite mountain: It is — to quote the General — "this team which is unique in the western world."

The staff of Monitoring Times *would like to extend its sincere appreciation to General J.D. O'Blenis - Deputy CINC NORAD, the NORAD battlestaff team, and the entire public affairs staff at NORAD/USSPACECOM— especially Major Don Planalp, for their assistance during our recent tour of "The Mountain."*

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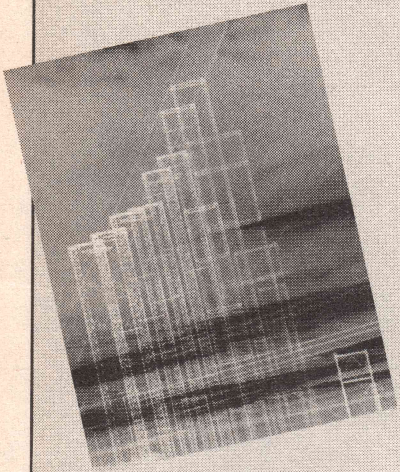
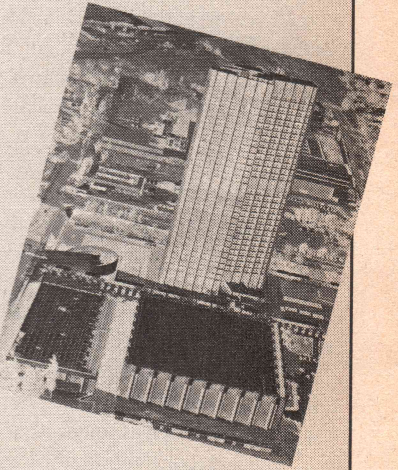
CHANNEL AFRICA



Shortwave History of South Africa



By Colin Miller

During the past few years the world has undergone unprecedented political changes. The Berlin Wall fell, and the Soviet Union with its Communist ideology crumbled. And in South Africa, former president F.W. de Klerk introduced sweeping reforms, including the release of political prisoner Nelson Mandela, and the end of the apartheid policy. After nearly two years, this country seems to be surviving under the new ANC government of President Mandela.

The year 1995 has seen many special anniversaries, the most notable being the 50th anniversary of the end of World War II. Radio, too, has had its share of anniversaries: the 50th birthday of Radio Canada Iinternational, 60 years of Radio Japan, 50 years since the founding of FEBC Philippines, 25 years of broadcasting from FEBA Seychelles; the list goes on.

October 1995 also marked the 30th anniversary of the inauguration of the Meyerton shortwave transmitting station near Johannesburg. That is perhaps as good an excuse as any to look at the interesting history of shortwave broadcasting in South Africa.

Like many African countries, South Africa covers a large area, a little more than 471,000 square miles: that's more than 1-1/2 times the size of Texas, or somewhat larger than Ontario. It would require a large number of local stations to adequately cover the whole country. Today, South Africa is indeed served by an extensive FM network, but in the early years it was a different story.

The Early Years

The first radio stations opened on medium wave in 1923 and 1924 in the three largest cities of Johannesburg, Cape Town, and Durban. Even though a large proportion of the population was covered, listeners living in the vast country areas could only pick up the broadcasts at night. In addition, at certain times of the year, particularly during the summer, high static levels caused by heavy thunder activity made reception difficult or impossible. Therefore, an alternative mode of transmission was clearly necessary.

On April 1, 1927, the three stations formed the African Broadcasting Company (ABC), and the first experimental shortwave transmissions were made on 40 meters from Durban. The first regular shortwave transmissions in South Africa began from the ABC in January 1931, using a 250 watt transmitter at Maraisburg, 10 miles west of Johannesburg. In March 1932 the power was increased to 1 kW. Later, the old shortwave unit was scrapped and replaced by a more modern 1 kW transmitter which was built in the SABC workshops and went into service on October 18, 1942. Both these transmitters carried the English program.

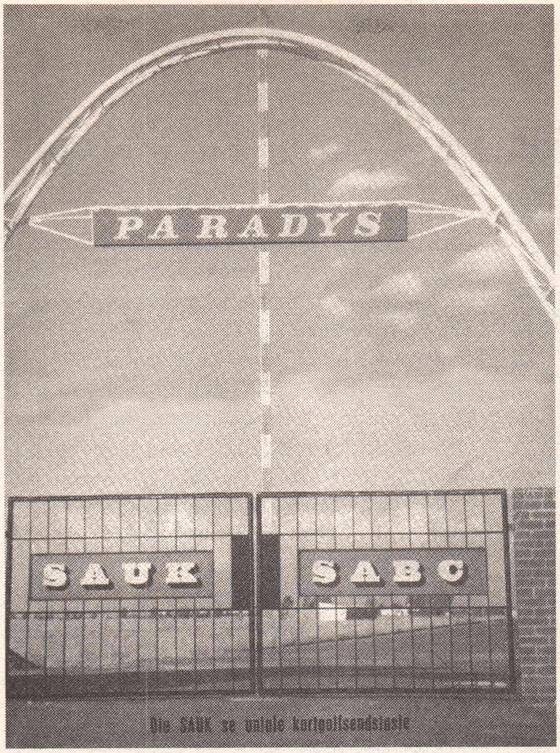
The ABC did little to promote broadcasting in the Afrikaans language, and by the time it was handed over to the South African Broadcasting Corporation (SABC) in 1936, Afrikaans was being broadcast only on one evening a week from the various stations. Consequently, when the SABC took over the existing facilities, it had to face the problem of broadcasting in Afrikaans with little or no equipment at its disposal.

An experiment was made by the SABC in 1936 to start broadcasting bilingual programs from each station. But this did not prove very popular with listeners, which meant that separate transmissions were required. The new Afrikaans service would be called the B Program, in order to distinguish it from the existing service in English, which became the A Program.

A start was made by hiring two 5 kW shortwave transmitters for the Afrikaans service, one from the Overseas Communications Station at Klipheuwel near Cape Town, and the other from the General Post Office station at Roberts Heights (in Afrikaans, Voortrekkerhoogte), near Pretoria. Klipheuwel (ZRK) went into operation on October 25, 1937, and Roberts Heights (ZRH) two months later.

Afrikaans coverage on shortwave was subsequently expanded. A 5 kW transmitter was inaugurated from Maraisburg on October 5, 1941. In 1946, a temporary 400 watt shortwave transmitter was in use at the Pietermaritzburg site, about 55 miles inland from Durban, until a medium wave transmitter was installed a few years later.

An experimental 400 watt shortwave transmitter went on the air at Welgedacht, east of Johannesburg, on April 27, 1949, carrying the English Program and using a directional antenna to South West Africa/Namibia. Also at Welgedacht, a 5 kW shortwave transmitter went into operation on May 1, 1950, carrying the new Springbok Radio—the SABC's first and probably most popular bilingual commercial service. Long-time DXers may still remember logging Springbok Radio until it left shortwave in 1979.



The Paradys site carried the first Africa service in the 1960s.

On checking the information on South Africa in the July 1941 issue of *White's Radio Log*, and the 1950 and 1954 editions of the *World Radio Handbook*, the stations shown in the table on page 16 were listed. Note that in those days it was quite common for stations to broadcast out-of-band and on split frequencies.

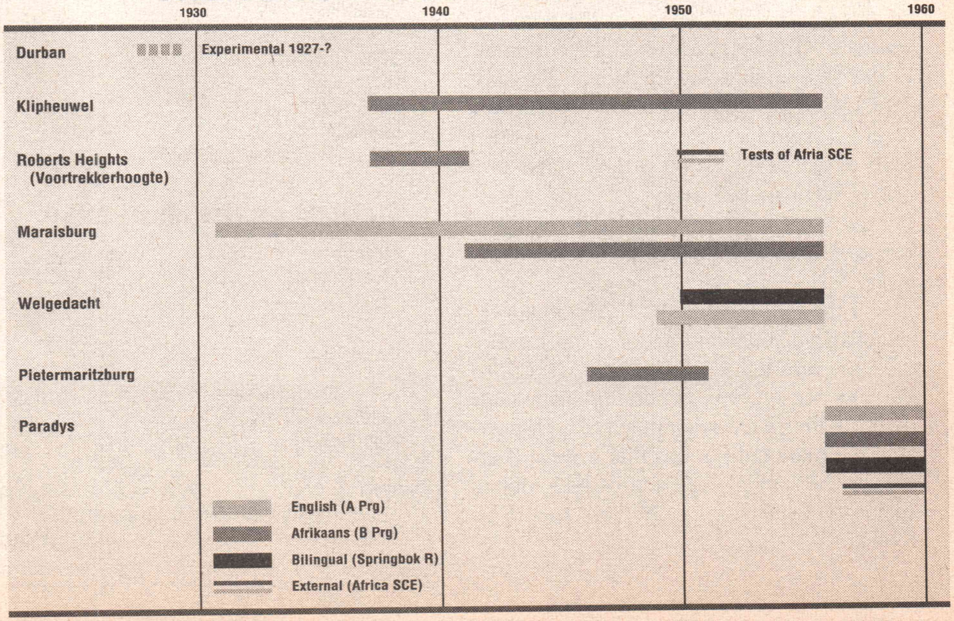
■ Paradys

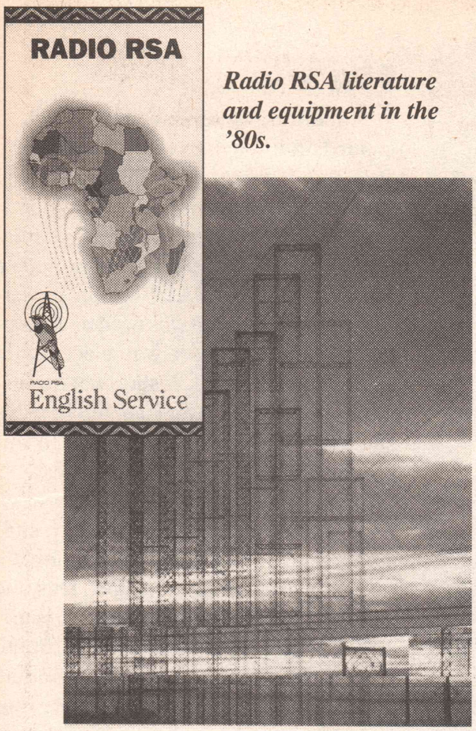
Medium wave coverage had expanded after the war, until, by the early 50's, there was a total of 12 transmitting stations, each carrying three programs. But the shortwave transmitters, of relatively low power, still did not provide a satisfactory service. A new, more powerful shortwave station was needed. In September 1952 an order was placed with Marconi for nine 20 kW shortwave transmitters to be used at the planned Paradys site near Bloemfontein, in order to improve reception in the country areas.

Construction began on the new, higher, powered shortwave center, situated about 12 miles south of Bloemfontein on the main road to the Cape. This site was ideally located in flat countryside, almost at the geographical centre of South Africa. The nine modern transmitters were installed, two for each of the four services. The station began regular service on July 1, 1956. There were 18 log periodic antennas for the three national services and seven directional antennas for the new Africa Service.

Two frequencies were always in use simultaneously, so that if reception was poor on one of them, it was usually better on the other. Paradys provided excellent reception over most of the country, as well as good signals in neighbouring countries. The station remained in service until the late 60's. One of the transmitters was donated to the Malawi Broadcasting Corporation, and is still in use

South African Shortwave Stations 1927-1960





Radio RSA literature and equipment in the '80s.

today! It is not unreasonable to believe that some of the others may have been in use by Rhodesia during the mid 60's to jam BBC broadcasts to that country from the station at Francistown, Botswana.

External Broadcasts

As mentioned above, the Paradys station carried the Africa Service, the first attempt by the SABC to provide a regular service to listeners in other African countries. Tests had been made at the end of 1950 from the old 5 kW GPO transmitter at Voortrekkerhoogte. Regular transmissions began on January 1, 1957, in the 19 and 11 meter bands. The service consisted of relays of the domestic services: Afrikaans on Monday, Wednesday, Friday and Sunday, and English on Tuesday, Thursday, and Saturday. Regular reports were received from listeners in Europe and other parts of the world. Some of the English programs were in fact relayed by the British Forces Broadcasting Station in Nairobi, Kenya. But the Africa Service was not really a true "external service," however.

By the mid 60's the SABC had plans to establish a distinct international service, Radio RSA, now known as Channel Africa. The Paradys station was becoming inadequate owing to the increasing number of high-powered international stations that were appearing on the bands. As Paradys had limited space for expansion, a new site had to be found.

Bloemendal (Meyerton)

During 1964 the ground for a major radio transmitting station was purchased in a hilly region near Meyerton, about 25 miles south of Johannesburg, and four 250 kW Brown Boveri transmitters were ordered for the external service. The SABC board of governors, under the chairmanship of Dr. P.J. Meyer, instructed the management to carry on with detailed planning for comprehensive external service programs.

This became a very important development for the SABC. Detailed plans were formulated in the first quarter of 1965. On 27 October 1965, Dr. H.F. Verwoerd, then Prime Minister, officially opened the transmission station, which was located at Bloemendal near Meyerton and was named the H.F. Verwoerd Transmitting Station after him. That day the first of the four transmitters came into operation at the station. About six months later, Verwoerd was assassinated in Parliament.

From Bloemendal, Channel Africa directs programs in English and a number of other languages to the African continent. The programs originate from studios located in Auckland Park, Johannesburg—one of the largest broadcasting centers in the world on one site. In fact, the radio and TV studios, as well as the offices, occupy a suburb known as Uitsaaisentrum (Broadcasting Center).

A multitude of tall, steel columns, towering into blue skies, with rows of antennas are the first signs of the shortwave station when approached from the small village of Meyerton. The main transmitter building, with antenna-switching house, was originally equipped with four 250 kW Brown-Boveri transmitters. The transmitter tuning, antenna selection, and slewing are controlled from

Continued on Page 18

Stations on the air in July 1941:

Station	Call	kHz
Cape Town (Klipheuwel)	ZRK	6098
	ZRL	9606
		9690
Johannesburg (Roberts Hts)	ZRH	6007
(Maraisburg)	ZRG	9523

Stations on the air in early 1950:

Johannesburg III (Maraisburg)	B	3450 kHz	5 kW inactive
		4895 kHz	5 kW
		6007 kHz	5 kW inactive
		9523 kHz	5 kW
		11710 kHz	5 kW inactive
Johannesburg IV (Maraisburg)	A	4800 kHz	1 kW
		6095 kHz	1 kW inactive
		9870 kHz	1 kW
Johannesburg V (Welgedacht)	A	4384 kHz	0.2 kW
Cape Town III (Klipheuwel)	B	5880 kHz	5 kW
		9610 kHz	5 kW
Pietermaritzburg	B	4878 kHz	0.2 kW
Mafeking	A	5900 kHz	0.2 kW

(This is ZNB Mafeking, referred to in Feb 95 *MT* article about Botswana.)

Stations on the air in 1954:

Station	English	Afrikaans	Springbok R
Johannesburg	3290	3370	3356
	4800	4895	4945
	6095	6007	7295
	7230	7275	9600
	9870	9523	
(English/Afrikaans from Maraisburg, and Springbok from Welgedacht)			
Cape Town (Klipheuwel)	5892		
	7255		
	9610		
Africa Service	9870 (Maraisburg)		
	15230		
SWA Service	9680 (Welgedacht)		

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by U.S. Customs.

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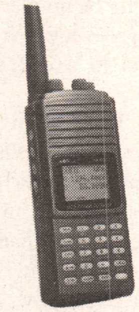

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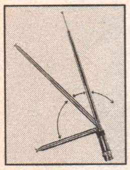

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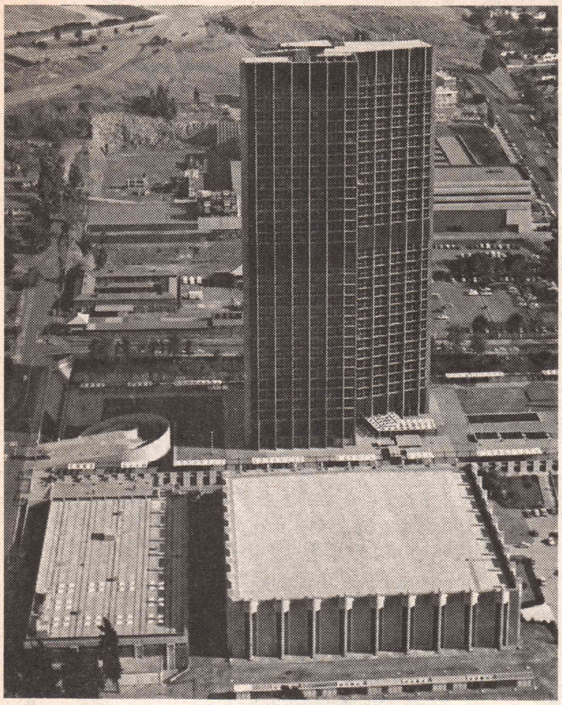

Broadcasting Centre is one of the largest broadcasting sites in the world. Radio South Africa has been renamed Channel Africa to reflect the country's changing image (see brochure below right).

two consoles in the control room.

From here the transmitters may be coupled to any of the station's high-gain antenna arrays to cover the target areas. The consoles also have preselection facilities so that a new frequency and antenna with appropriate orientation may be selected within seconds.

The cooling of the transmitters is by the vapodyne system which utilizes the latent heat of steam in order to obtain more efficient cooling. The vapodyne system uses a small amount of distilled water. The steam is condensed on the mezzanine level of the building by heat exchangers and returns to the transmitter tube anodes as water, from where it is once more circulated in the closed cooling system.

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The directional antenna arrays each consist of two curtains spaced a quarter of a wavelength apart. Each curtain is made up of three or five stacks of four half-wave dipole elements in a chain. When power from the transmitter is fed into the front curtain, the radiations from the individual dipoles are additive in the direction of the main transmitting zone, the total power gain achieved in some instances being as much as 20 dB, which is equivalent to a magnification factor of 100. By phasing, it is possible to slew the beam electrically 15 or 30 degrees away from its center position to a different target area.

In 1977, three Telefunken 500 kW transmitters were added, which enabled the external service to expand further. For example, during the early 80's, a service in Spanish was inaugurated to Latin America.

Sadly, on April 30, 1990, Radio RSA discontinued services to all target areas except Africa. This was caused by severe financial constraints, and a reduction in staff. On October 1, 1992, the station was renamed Channel Africa, and gradually changed its image, eventually reflecting the new South Africa. Some of the original 34 antennas were taken down, but apart from this, not too much has changed over the years at Bloemendal.

International Relays

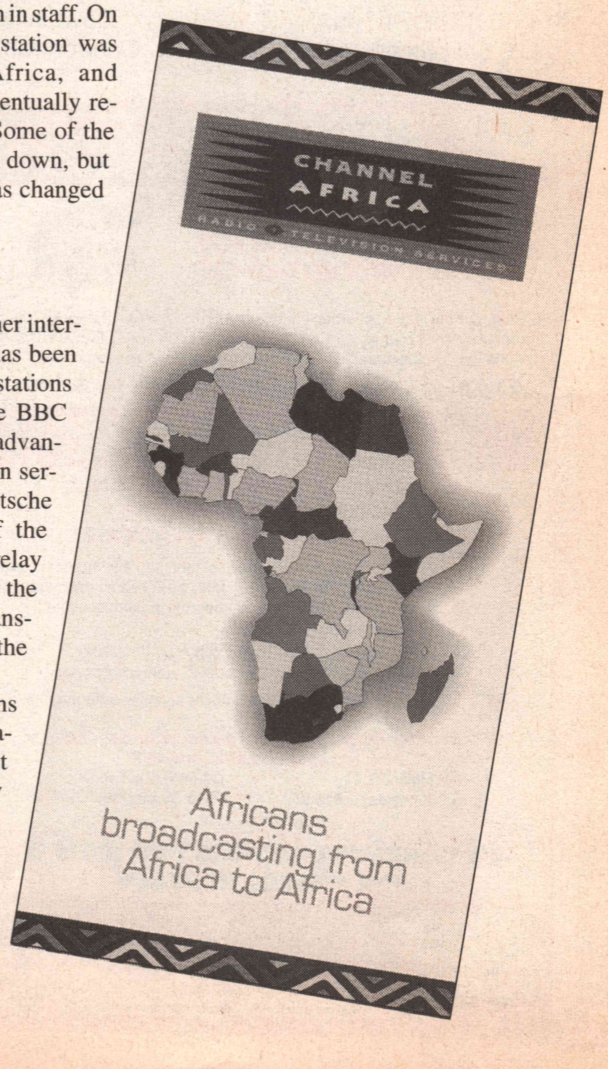
As is the case with several other international stations, South Africa has been renting transmitter time to other stations from the Meyerton facility. The BBC was the first broadcaster to take advantage, relaying some of its African services. Then in July 1994 Deutsche Welle made temporary use of the Meyerton station, after its Kigali relay had become inoperative due to the crisis in Rwanda. They ceased transmissions from South Africa at the end of 1994.

Then in December 1994 Trans World Radio began using the station for some of its services to East and West Africa. The VOA now uses Meyerton to supplement some of its transmissions to Africa. TWR may take up some more transmitting time later this year, and VOA will add a further hour to West Africa in the mornings.

Domestic Relays

A second, separate transmitter building can be found at Bloemendal, as this site is also the home of SABC shortwave domestic services (Radio 2000, Afrikaans Stereo, and Radio Oranje). The building is located about three miles away from the first transmitter building, and houses four 100 kW Thomson transmitters for these services, the target area being the North-West Cape. Log periodic antennas are in use. The North-West Cape is predominantly a rural area and not very densely populated. This area has had limited FM coverage, hence the shortwave domestic service. It is not known how long shortwave will continue, as there are continual budget cuts at the SABC.

A lot of changes have occurred in shortwave broadcasting in South Africa during the past 50 years. Let's hope that, despite the present economic situation and technological developments with satellites, shortwave will continue from this part of the African continent for many years to come.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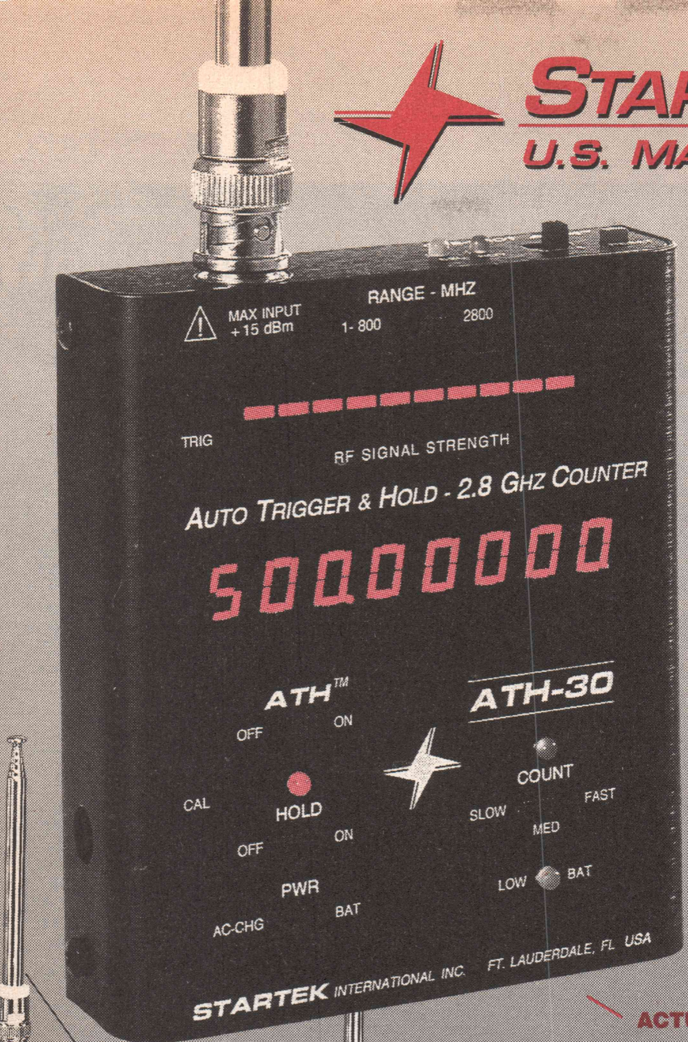

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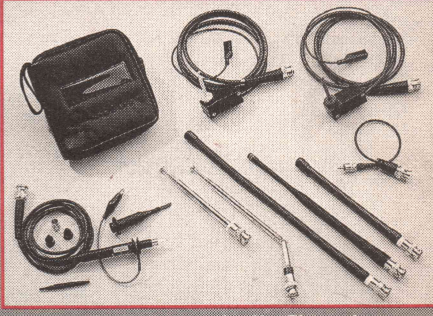

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Understanding Trunked Radio Monitoring Laws

As The Dust Settles

• • •

Photo by Ed Hesse

By Jorge Rodriguez
jr@digital.net

Can you legally listen to your local police, or not? A case in Tulsa may be setting a new precedent.

For over thirty years, Larry Gass has protected the people and property of Tulsa, Oklahoma. As the owner of Tulsa Security, Gass and his employees patrolled the streets of Tulsa and provided protective services, working closely with local law enforcement. Once when a helicopter owned by one of Gass' companies landed in the street, a neighbor complained and the police reported the incident to the Federal Aviation Administration (FAA). Another time Larry Gass was accused of interfering with police officers while they were flying helicopter support during a pursuit. The relationship between Larry Gass and the local authorities began to strain, and again the Tulsa Police filed a complaint with the FAA. A few months later, tempers flared again when Larry Gass accused the police department of covering-up the details and severity of damage caused to a police helicopter when it struck a wire.

The Tulsa Police and Larry Gass have always been on the same side of the law, but some officers didn't see it that way. Finally in April after a year-long investigation, Tulsa authorities found something they thought Larry Gass did wrong. Gass was charged, under a rarely-used federal law, with selling wiretap and eavesdropping equipment to various news organizations in Tulsa. The equipment were reprogrammed Standard Brand and Motorola trunked radios which could listen to all of the City of Tulsa' new trunked radio system.

The city of Tulsa operates a trunked radio system designed by Motorola for its police and fire departments. The trunked system makes efficient use of the radio spectrum by allowing all users to share the twenty channels licensed to the system. When it was implemented, the city gave local media access to only three dispatch frequencies. The rest of the system, which the city claims is used for surveillance, SWAT, and other special operations, is off limits.

Eventually most of the news media in Tulsa obtained reprogrammed radios that would receive all of the Tulsa police channels; some, but not all, were sold by Larry Gass. Although all the frequencies in the system are readily accessible to anyone with an unmodified 800 megahertz scanner, entire conversations cannot be followed easily, as they move from frequency to frequency when there is a pause.

During Larry Gass' trial in July, a former employee, Jon David Astacio, claimed that the radios were modified at the direction of Mr. Gass, using copyrighted software from Motorola and Standard—software like Motorola's STX Lab Tools: a program that allows a person to reprogrammed a trunked radio without having the system keys and a program which is normally not available to the public. But, it's also one which Astacio and other radio users seem to have no trouble obtaining from local radio shops or area hamfests (radio and computer flea markets held nearly every weekend throughout the nation).

Pulling No Punches

According to the Government's charges in the indictment against Gass, he violated Chapter 47 of the United States Code section 605 (a), also known as section 705 (a) of the 1934 Communications Act, and, more specifically, section 605 (e)(4). That section makes it a crime for a person to modify a radio, knowing, or having reason to know, that the radio is intended for activity prohibited under the law. That prohibited activity, the government went on to say, was the actual monitoring and subsequent divulgence of certain protected communications, in violation of 605 (a) which states that *"No person not being authorized by the sender shall intercept any radio communication and divulge or publish the existence, contents, substance, purport, effect, or meaning of such intercepted communications to any person."*

There was only one problem for the government: section 605 was amended in 1986 by the Electronic Communications Privacy Act and the language *"Except as provided by chapter 119..."* was added to the beginning of that section. Chapter 119 specifically allows any person to monitor police radio transmissions, and the two laws seem opposed.

Not to worry; in the Gass case, the government argued that the exception applies only to the *first* sentence in section 605 (a). Before, during, and after trial, Larry Gass and his attorneys James Lang and Steve Stidham tried repeatedly to show Judge H. Dale Cook that Congress intended the exception to apply to *all* of section 605 (a). Both the legislative history of the 1986 amendments and what little case law exists dealing with the issue, indicated that the entire section was exempted by Chapter 119. This fact was no revelation to authors and experts on radio monitoring who had written that listening to trunked systems was permissible under the new law, after 1986.

Scott Woodward, the U.S. Attorney who prosecuted the case, argued that the reprogrammed radios are not scanners and obtained an early order excluding from evidence issues of *Police Call*, a copy of *Radio* magazine No. 3, and RVACS Systems' *Scanner Guide for Oklahoma 1992*, all of which indicate that it is legal to monitor a trunked system.

Gass is charged with modifying trunked radios (mostly Standard Brand, as shown here) to receive prohibited transmissions—his local police department communications. A section of the law he was charged with violating appears below.

47 USC s 605
(Section 705 of the Communications Act)

Sec. 605. Unauthorized publication or use of communications

(a) Practices prohibited

Except as authorized by chapter 119, Title 18, no person receiving, assisting in receiving, transmitting, or assisting in transmitting, any interstate or foreign communication by wire or radio shall divulge or publish the existence, contents, substance, purport, effect, or meaning thereof, except through authorized channels of transmission or reception, (1) to any person other than the addressee, his agent, or attorney, (2) to a person employed or authorized to forward such communication to its destination, (3) to proper accounting or distributing officers of the various communicating centers over which the communication may be passed, (4) to the master of a ship under whom he is serving, (5) in response to a subpoena issued by a court of competent jurisdiction, or (6) on demand of other lawful authority. No person not being authorized by the sender shall intercept any radio communication and divulge or publish the existence, contents, substance, purport, effect, or meaning of such intercepted communication to any person. No person not being entitled thereto shall receive or assist in receiving any interstate or foreign communication by radio and use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. No person having received any intercepted radio communication or having become acquainted with the contents, substance, purport, effect, or meaning of such communication (or any part thereof) knowing that such communication was intercepted, shall divulge or publish the existence, contents, substance, purport, effect, or meaning of such communication (or any part thereof) or use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. This section shall not apply to the receiving, divulging, publishing, or utilizing the contents of radio communication which is transmitted by any station for the use of the general public, which relates to ships, aircraft, vehicles, or persons in distress, or which is transmitted by an amateur radio station operator or by a citizens band radio operator.

Counter Punches

Whether Chapter 119 applies to all of section 605 or just to the first sentence may seem to be a minor point, but it is on such tiny, seemingly insignificant rules of statutory construction that entire cases are won or lost. If Gass and his attorney are correct—and most radio enthusiasts believe they are—Larry Gass' interception of radio communications, authorized by Chapter 119, could not be a violation of the second sentence of section 605 (a) under which he was charged.

Clearly, Chapter 119, when it was amended in 1986, specifically authorizes the interception of radio communications such as the police communications at issue in this case. The law only excludes from legal monitoring those signals which are not readily accessible to the general public. It defines "readily available" as those communications which are not (1) scrambled or encrypted, (2) using modulation techniques withheld from the public (e.g., spread spectrum), (3) audio subcarrier transmissions, (4) transmissions over a common carrier communications system, such as mobile and cellular telephones, plus two other exceptions not applicable to this case.

The Government argued in the Gass case that under Chapter 119 the conversations at issue were transmitted using modulation techniques whose essential parameters had been withheld from the public with the intention of preserving the privacy of such communications. At trial Tulsa Police Chief Ron Palmer testified that it was important that a police radio system not be monitored by citizens. Gass and his attorney countered that the legislative history of the amendments shows that the withheld modulation techniques referred to meant spread spectrum communications.

Trunked radio systems are not spread spectrum communications, although it's understandable why the two can be confused. In a spread spectrum communication, a predetermined formula tells each radio when to switch to another frequency, even during the same continuous transmission. In a trunked system, the radios acquire an available frequency from the pool of available frequencies and use it throughout that transmission. Since most transmissions are short, the same conversation jumps among the available frequencies in the system each time the person speaking, pauses. This gives the appearance of a spread spectrum communication, but is not.

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The case of . . . Gass will sound taps for the monitoring of police trunked radios systems for now.

There can be little doubt from reading the Electronic Communications Privacy Act amendments of 1986 that the law makes it lawful to intercept any radio ... of law enforcement, which is readily accessible to the public. The law specifically states "It shall **NOT** be unlawful under this chapter ... to intercept any radio communication which is transmitted by any governmental, law enforcement, civil defense, private land mobile, or public safety communications system, including police and fire, readily accessible to the general public."

Another one of the Government's theories in the case was that the act of listening to a radio communication, without the authority of the sender, constitutes divulgement and/or publication under section 605 (a). The Court agreed with the Government's position and found that the provisions of Chapter 119 apply only to first sentence of 605 (a), but not to the second sentence, which Larry Gass was accused of violating.

Gass' other arguments in the case were likewise rejected by the Court. For example, the Government claimed Gass and his employees monitored the radios and reported what they heard to the media, but no such evidence was presented at trial. The Government also failed to prove an objective or subjective expectation of privacy by the dispatchers using the radios, or that Larry Gass had reason to know that publication or divulgence was intended. It would have been entirely possible for a news photographer, for example, to monitor any of the forbidden channels, go to the scene to photograph whatever action could be viewed from a public vantage point, and still not have divulged or published the existence, contents, substance, purport, effect, or meaning of the intercepted communications to any person.

Will this Decision be Contested?

An odd point came in the case came when the Government tried to claim that Larry Gass' conduct was illegal, based on the rules promulgated by the Tulsa Police and Fire Department—as if they had some law-making authority granted to them by the voting citizens of Tulsa, Oklahoma.

Interestingly, Oklahoma authorities could not have charged Larry Gass with violating Oklahoma's own state law concerning receiving police frequencies. That law only prohibits a person from operating a mobile radio that can receive law enforcement radio transmissions, *if the listener has an illegal purpose or is committing another crime "and not otherwise."* The law makers in Oklahoma intended for law abiding citizens to be permitted to listen to their police radio communications at work and home.

If the government prevails, despite Larry Gass' post trial motions and appeal, the case of the United States of America versus Larry Gass will sound taps for the monitoring of police trunked radios systems for now. Although the Gass case involved reprogrammed Standard Brand and Motorola radios, and he was actually charged with selling or modifying those radios for unauthorized listeners, the law coming out of this case seems to mean that merely listening to police trunked radio systems is illegal—even listening by law abiding hobbyists using ordinary scanners.

Unlike the Harris case in Florida last year (see *Monitoring Times* November 1994), which was a civil case brought by Motorola, Gass was charged in a 27-count indictment with violating several federal criminal laws, mostly for modifying Standard Brand, not Motorola radios. If the Court fails to recognize that under the law Gass committed no crime, he faces up to 85 years in prison and over $4. million dollars in fines when he's sentenced later this year.

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The 15 Biggest Mistakes to Avoid in Buying a Scanner

By Ed Hesse, WB2RVA

If you're a newcomer to monitoring, you may be a little overwhelmed by the number of scanners on the market. How do you know what scanner(s) to buy? Or even more important, how do you avoid buying a scanner which is inappropriate for you, especially if you're on a limited budget?

Many experienced scanner monitors own several scanners. They probably bought these scanners in a search for the "ultimate" unit, something that would do everything they wanted a scanner to do. Looking back, they can see a number of mistakes they made in their search for perfection. From this vantage point, they feel their approach would have been different—had they known better. The purpose of this article is to help the scanner newcomer to avoid such mistakes.

1

Putting too much emphasis on the number of channels.

You leaf through a catalog or magazine and see a scanner with 1,000 channels. "Wow! What a scanner," you think. "If I had that, boy, would I be a happy camper, er, monitor."

If you think it through, it will take you a long time to find 1,000 frequencies to put into the scanner. And then it will take you a long time to program them. And after you've programmed them, you'll probably want to make a list of the frequencies and their respective channel numbers, just to find them again. It's a rare individual who needs—or who can use—a scanner with 1,000 channels. Why spend the money if you don't need that many channels?

2

Putting too little emphasis on the number of banks.

"Banks" are the method used to separate the channels into more usable scanning. For example, one scanner with 200 channels allows them to be separated into 10 banks of 20 channels each. This allows you to use bank 1 for, say, police, bank 2 for fire and EMS, and so forth. However, another scanner—which offers 400 channels—has only four banks! This means that the user is severely limited in assigning channels and banks to specialized areas of monitoring. As a rule of thumb, the more banks, the better.

3

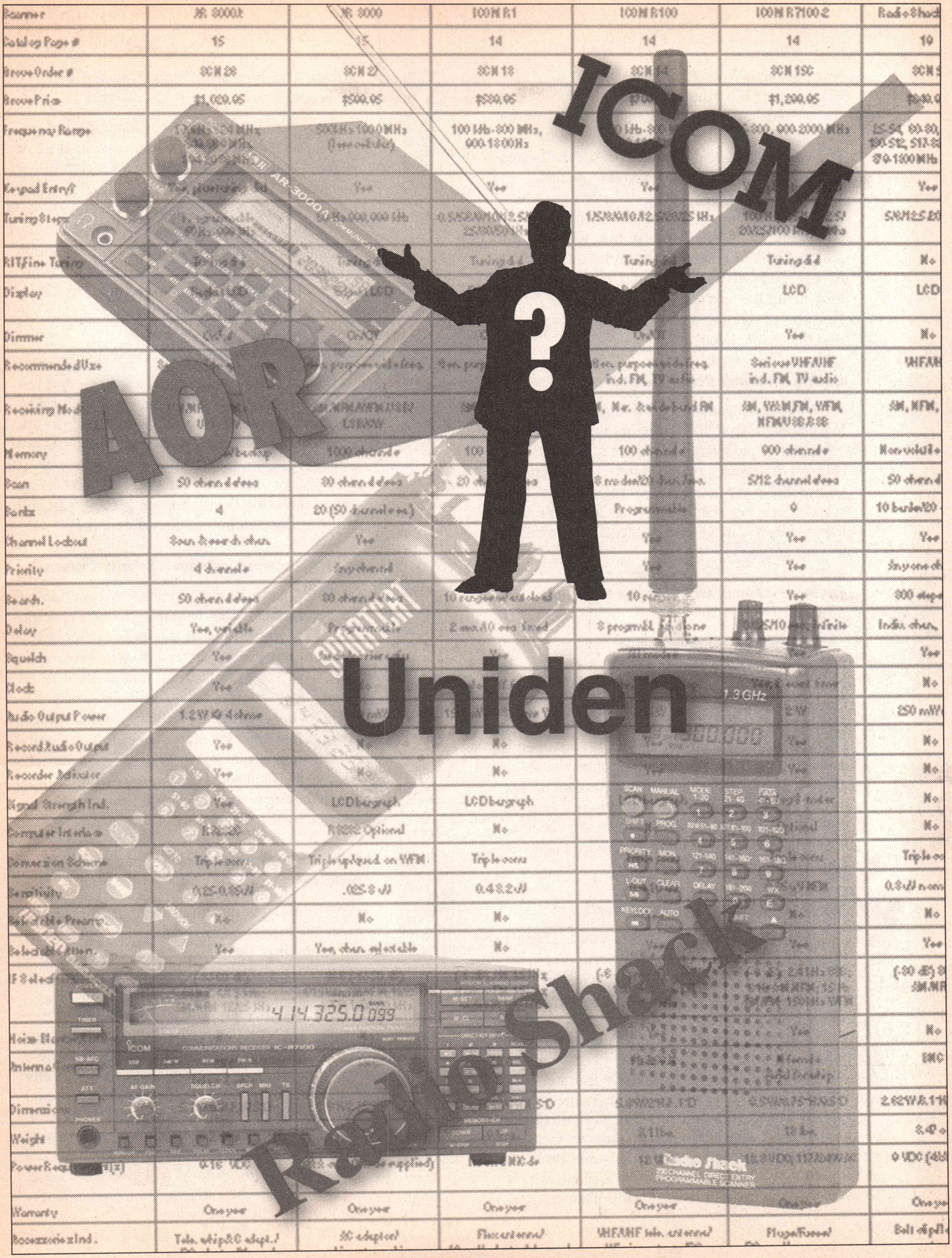
Buying a scanner with a limited frequency range.

Many scanners have "gaps" in their frequency ranges. For example, you may buy a scanner which covers MHz ranges like 30-50, 108-174, 380-512, and 806-956 (excluding cellular). Obviously, there are a lot of gaps in this scanner, and some of these gaps could provide interesting listening. As you grow in the scanning hobby, you'll become more aware of the monitoring possibilities that are available—if your scanner can receive them. The radio spectrum is changing today, and the greater the coverage of your scanner, the greater the enjoyment it can give you. Why buy a scanner with limited coverage?

4

Placing too much emphasis on scanning speed.

An advertisement proclaims that the unit scans at 100 channels per second. Again, Wow! But think about it. Let's say you've got 100 channels in the bank of your scanner. You turn it on, and it starts looking for a busy channel which it finds on channel 99. That takes a second. Let's look at a much slower scanner. It moves at the rate of 14 channels per second. You turn that on, and it takes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seven seconds to reach channel 99.

So what? What did you miss during those extra six seconds? Yes, speed is nice but it's not an overwhelming consideration in buying a scanner. Focus on the essentials, not on the bells and whistles which add little to your enjoyment.

Why not look for, say, a delay feature which lets you expand the delay to more than two seconds (selectable delay)? Isn't it frustrating when there's a slight break in a two-way transmission and, after two seconds, the scanner goes hell-for-leather, looking for the next transmission down the band? And you go running back to the scanner, trying to find the channel you were listening to.

5

Buying a scanner that's "too hot" or "too cold."

We're talking about sensitivity here. If you're in a heavy RF area (like a metropolitan area), why have a "hot" receiver, if it's going to bring in a lot of noise on your signals? On the other hand, if you're out in the country straining for a signal, a scanner with low sensitivity won't make you very happy. Buy a scanner whose sensitivity is matched to your area.

6

Buying a scanner with only one source of power.

Many monitors want a scanner that can be used in a number of environments. Most monitoring is done at home and, of course, you want a scanner that will run on AC power. But what about using your scanner in the car (where local law permits)? Can you use your scanner in your car by plugging it into the cigarette lighter? And, once you leave the car, can you drop the scanner in a coat pocket or clip it to your belt and listen to it as it runs on batteries? When considering a scanner, check to see if it's powered to run in the environments in which you plan to use it.

7

Buying a scanner which won't search.

Hard to believe, but some scanners can't "search." Searching is a feature where you can set a bottom and a top limit of frequencies, and the scanner will go through this set of frequencies looking for activity.

For example, let's say you'd like to see if there's any railroad activity in your area. You set 160.215 as the bottom of the search range and 161.565 as the top, and then let the scanner continually search through this range. If there's a transmission, the scanner will stop on the frequency and stay there until the transmission ends. In this way, you can find new frequencies which you can put into the "scanning" side of the scanner.

8

Buying a scanner with limited "modes" of coverage.

Most scanners have only one "mode" of coverage: FM narrow, which covers the majority of stations you'll hear on your scanner. However, there are other transmissions which call for other modes, such as AM (for aircraft), USB/LSB (for some amateur radio transmissions), and FM wide (which is used for FM broadcasts and the audio portion of TV broadcasts). If you'd like your scanner to be able to cover "everything" that's out there, be sure it will cover the various modes.

9

Buying a scanner with inadequate audio.

Nothing is as frustrating as a scanner that you can hardly hear or one that has audio which, when increased, causes distortion. If you plan to use your scanner solely in your home, its audio is not a major concern. However, if you plan to carry it with you or listen in your car, audio is a very important factor. One expert suggests at least 200 milliwatts as a minimum for outdoor use.

10

Buying a scanner without a priority feature.

This feature allows you to enjoy your normal scanning while being able to monitor a specific frequency for activity. If this priority frequency becomes active, the scanner will switch automatically to it. For example, you may wish to listen when the local fire department frequency becomes active, but while you wait, you'd like to do your normal scanning of frequencies. You simply put the fire frequency in priority, activate that feature, and then go back to your casual listening. When the fire trucks roll, you'll be automatically notified by the scanner.

11

Buying a scanner without a signal strength indicator.

A signal strength indicator (sometimes known as an "S" meter) gives you a visual indication of the strength of the signal being received by the scanner. This is very helpful when you want to determine the proximity of the transmitter.

For example, if you're monitoring police mobile units, it's interesting to see how close they are to you. If "jammers" are interfering with amateur radio transmissions, the signal strength indicator shows how close—or far—they are from the scanner. The indicator is also very helpful when measuring the effectiveness of the antenna(s) used with the scanner. And if Lojack is used by the local police, monitoring 173.075 will give you a warning that a stolen car is in your area...and probably being tracked by a police unit.

12

Not considering accessories which may come with the scanner.

Accessories that come with the scanner can do much to increase your enjoyment of the unit. For example, one scanner comes not only with an AC adaptor but two DC adaptors for using the scanner in an auto. Other accessories include earphones, belt clip, leatherette case, additional antennas for various bands, and mobile mounting hardware. Find out what's being offered with the scanner, and you may realize that you're getting a bargain for the price paid.

13

Buying a scanner with a limited service warranty.

Scanners are bought to be enjoyed. Most scanners will give a one-year warranty on performance. That is, if the scanner fails to perform in the first year after purchase, the manufacturer will repair or replace it without charge. Some manufacturers will give an extended warranty at relatively low cost. For example, you can add an extra four years of service (parts and labor) to one scanner for $40. This breaks down to about 20 cents a week for the peace of mind of knowing that if the unit breaks down during the first five years, the only cost to the purchaser is shipping it for repair. It's the author's opinion that the extra warranty is a good investment.

14

Relying too much on the antenna that comes with the unit.

Let's face it. The "stock" antennas that come with scanners leave something to be desired. The "rubber duckie" or "whip" antennas will bring in a number of signals, but if you want to hear everything that's "out there," you'll want to use an outdoor or an amplified antenna. Be sure that the scanner will accept (for example, through a BNC connector) such an antenna.

15

Being swayed too much by the price.

Yes, we're all attracted to a lower price. We sometimes equate a "low" price with "a bargain." The adage, "you get what you pay for," generally applies to the price of a scanner. The more features, the higher the price. The lower the price, the fewer the features. Think of a scanner as an investment which will pay dividends of enjoyment over a period of years. If the price is more than you can lay out at the moment, consider paying for the unit over a period of months by charging it.

There's nothing like the enjoyment of listening to a good scanner. There's nothing like knowing you've bought "just what you want and need." And there's nothing like knowing you've got a scanner that performs professionally, and the price you paid for it is fair.

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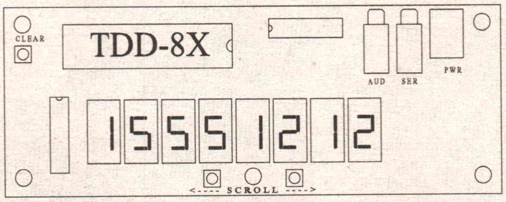

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Modern Radio Receivers

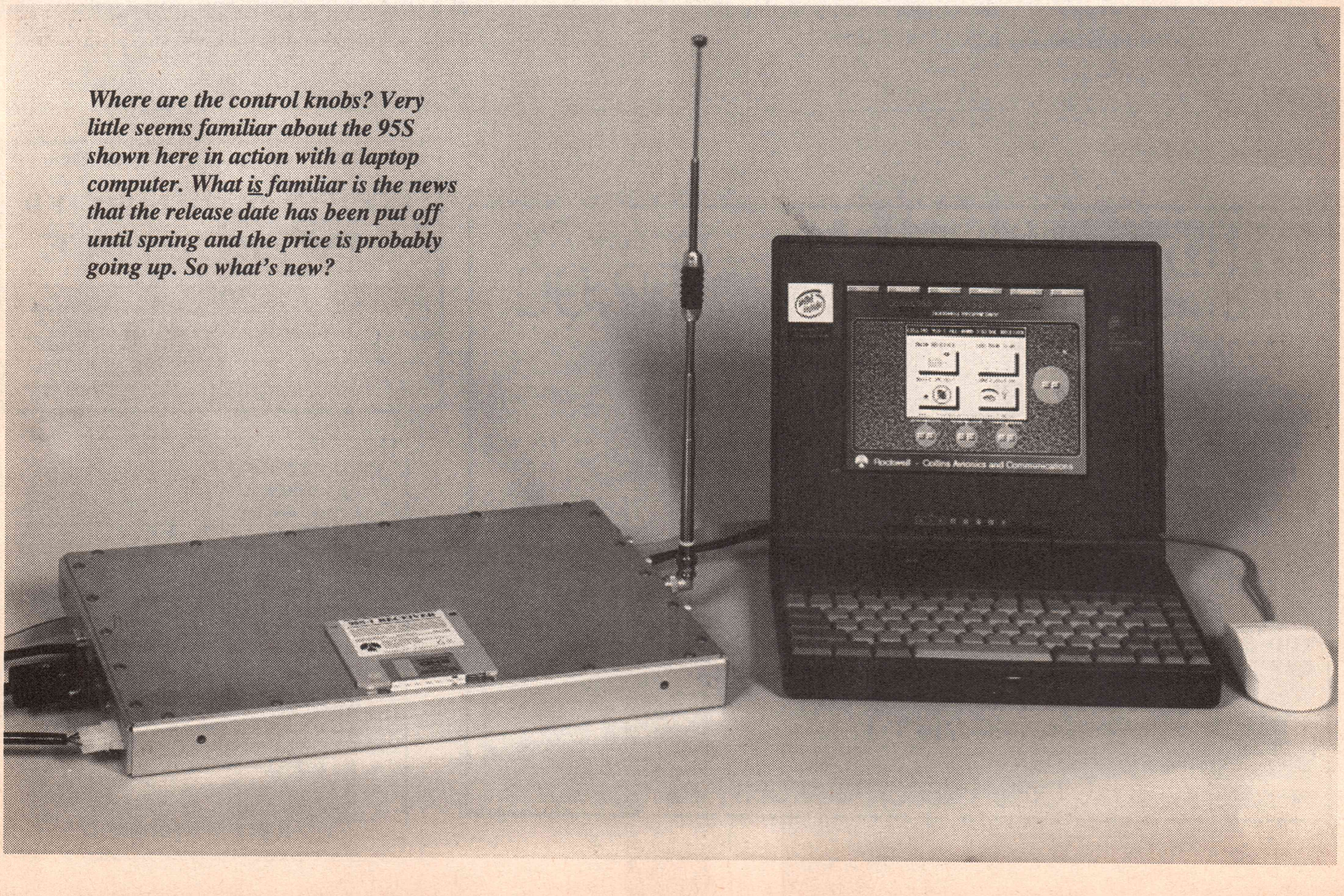
*How we got **here** from **there***

By John Catalano

There is no question or contest: Technology is always on the move by changing, improving, and finding new ways to do things better. Usually these changes mean the birth of new companies and the demise of old ones. However, with their introduction of a new, break-through receiver for the professional and high end consumer market, Collins Avionics and Communications division of Rockwell finds itself in the rare position of having been on the cutting edge from the beginning to the present.

Simply called the 95S Receiver, Collins' offering is a master of understatement, if the published specs are any indication of performance. How about the frequency coverage? Does 0.005 to 2000 MHz grab your interest? It should. Unlike some scanners that boast wide range, according to this manufacturer's specs the 95S really does maintain its selectivity and sensitivity over the entire frequency range.

Let's take a look at what makes the 95S so different. After all, some revolutionary new concept must be at the heart of a design which allows for such a wide frequency range, tuning increments of 1 Hz (no misprint), AM-FM-CW-USB-LSB-ISB modes, selectable bandwidths (which allow the user to cut out near-frequency interfering signals) of 100 to 300 Hz, plus optional software-downloadable filters, and computer control via an internal RS-232 serial port.


Where are the control knobs? Very little seems familiar about the 95S shown here in action with a laptop computer. What i̲s̲ familiar is the news that the release date has been put off until spring and the price is probably going up. So what's new?

To fully understand why this new receiver concept is so different, let's start from the beginning.

Folklore or Fact?

The Collins company traces its roots back to being a true pioneer of worldwide HF communications. In fact, Collins Radio may be the sole reason that the shortwave spectrum became so popular, especially with the military, in the second half of the 20th century. The story which I am about to tell you has been told over the past half-century in the circle of commercial and military communications companies. I can neither vouch for it, nor disprove it. But, it has become part of worldwide communication history's legend and myth.

At the end of World War II, the newly-formed United States Air Force, which had previously been part of the US Army, was flexing its new wings. One popular and respected Air Force general was Curtis LeMay. Some of you may remember LeMay from a 1960's presidential campaign in which he ran unsuccessfully as a vice presidential candidate. Legend has it that General LeMay was very taken by the capabilities of a relatively new, midwest, shortwave radio products company.

At this time, the US Air Force was trying to become a worldwide "global command" service, but their aspirations did not quite fit their capabilities. For one thing, the B-29, though being the most advanced and first computerized bomber aircraft in the world (thanks to Boeing and General Electric), still did not have true worldwide range. The B-36, which was almost off the drawing board, did promise global coverage.

But what about global communications to go along with this strategy? Both the military and some members of Congress were skeptical of the global force concept and seized upon the communications issue as a rallying point. No global communications, no global command.

According to the legend, General LeMay had gotten personally involved with this shortwave radio company. In fact, he served as a member of its board of directors. During one of his visits to the company he was told of a new product just coming out of the research and development group called single sideband (SSB). When monitored on a traditional AM receiver it sounded like Donald Duck talk. But due to its signal characteristics it promised much more reliable shortwave communications over a longer distance.

LeMay was trying to find a life jacket for his politically sinking global command air force concept. So with a bit of technical understanding—and some say a personal financial interest in the company—LeMay went for broke.

In a very bold and gutsy move he announced to his global critics that he could fly the world in an aircraft and never be out of contact with Washington. How? By installing this company's new SSB transceivers. The deal (so the story goes) was simple: If he succeeded, the company would be commissioned by the U.S. Air Force to equip every long-range aircraft and air force base in the world, *and* LeMay would be allowed the funds to build his global command unimpeded. On the downside, a failure would bring the global command concept to an abrupt close, with the loss of many senior military positions, including LeMay's.

The propagation gods must have smiled on the General, or they, too, were scared of him. In either case, the gamble succeeded. LeMay was in constant contact with his Washington headquarters as he circumnavigated the globe. The global command grew into the Strategic Air Command. LeMay rose to be head of the Air Force, head of the Joint Chiefs of Staff, and eventually a candidate for the position of vice president of the USA.

What happened to the midwest radio company Lemay counted on? Well, Collins Radio did very well for itself, thanks for asking.

Collins Radio set the pace for state-of-the-art communications equipment for the world in the 1950s, 1960s, and into 1970s. Models such as the KWM series (a very expensive commercial spin-off of the LeMay-gamble radios), were the dream of every ham. When military R-390 receivers hit the surplus markets they became the standard against which all others were measured. These tube (valve) radios held their own until the 1980s—quite a tribute to the Collins company and its people!

These Collins products were so well-engineered that even some of their competitor companies had to buy Collins components to even come close in performance. I know firsthand: I worked for a competitor that did just that and approved many purchase orders destined for Collins. Long after the initial prosperity of the LeMay years, Collins was purchased by an equally internationally respected and even more technically experienced company—Rockwell.

Enough History. What's New?

Look at Figure One on p. 30—the block diagram of the 95S—and compare it to the once state-of-the-art, but rapidly disappearing superheterodyne in Figure Two. Without even knowing anything about circuit design, and relying only on this graphic representation, we see that some things have really changed! Many of the "pictures" in the blocks don't look the same when we compare the two. Further, the names and letters on these blocks have little in common. What's happened?

The double conversion superheterodyne

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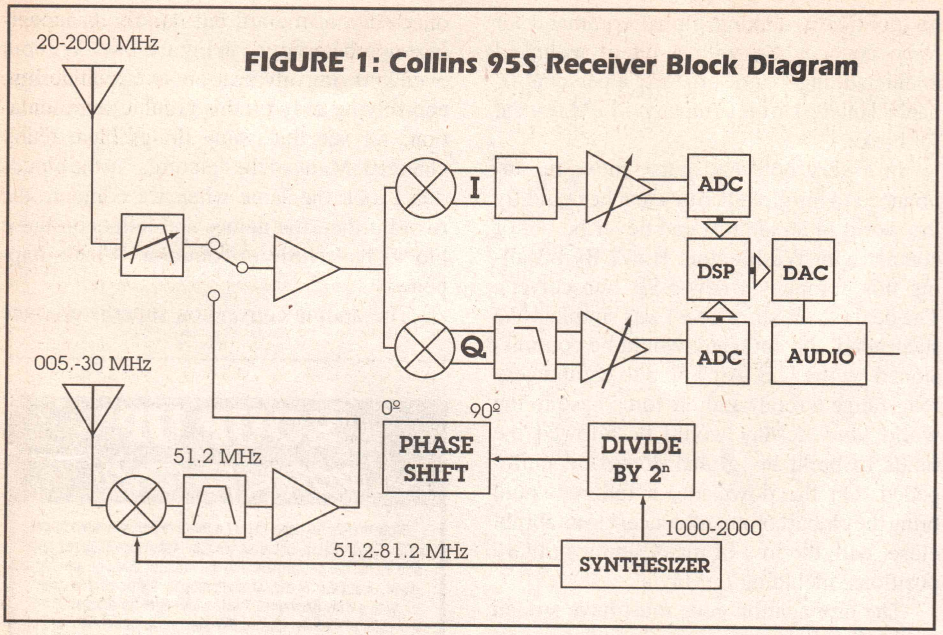
FIGURE 1: Collins 95S Receiver Block Diagram

(Figure 2) evolved to its current form over the years 1925 to 1945, a period of twenty years or so. It was not the only receiver design of its time. However, shortcomings in the actual performance and implementation of other methods (including super-regeneration and direct conversion) made the "superhet" the clear winner. But as we said in the beginning, technology does not stand still; in the past twenty years two very important developments have taken place.

Almost as a direct result of the mid 1970s Citizen Band craze, frequency synthesizers were improved, miniaturized into integrated circuits, and, most importantly, made available to manufacturers at very inexpensive cost. This was one of the key factors that enabled today's communication society. No longer were we "rock bound" to individual crystals for producing exact and stable frequencies used as a major component for "tuning" our receivers.

The second major breakthrough was slower in coming because it had to wait for the microprocessor to be invented, developed, refined, and greatly reduced in cost. For all this to happen a very large consumer market was required, which didn't even yet exist. Enter the home computer.

These preconditions, added to the development of software design environments, led to DSP—Digital Signal Processing—the second critical development in communications over the past twenty years. DSP starts by changing all signals into a digital representation of ones and zeros.

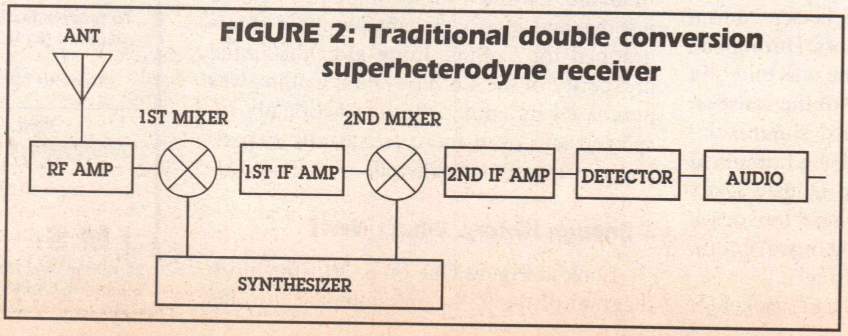
FIGURE 2: Traditional double conversion superheterodyne receiver

For simplicity, think of the difference between the old long-playing records (LPs) and compact discs (CDs). The LPs' grooves retained the movements of a cutting point which vibrated to the sound waves of Frank Sinatra's voice. The playback was simply the reversal of the operation. Mechanical movements of the record player needle following the record grooves were sensed as motion and amplified. Sound to movement; movement to sound.

This method is called analog, since the movement is "analogous" to the sound, as is the reverse process. This was the world of electronics until the mid 1970s.

About this time the technology of digital electronics was beginning to "grow up." Early digital electronics was nothing more than implementing simple logical concepts such as AND and OR. Using the binary number system, all numbers can be represented by a series of ones and zeros. In digital electronics "one" is considered the presence of a signal; "zero" not a signal. For example, an AND gate is just what it says. In order to get an output signal from an AND gate, both input signals must be present: signal 1 and signal 2. So in this case Input 1=1 AND Input 1=1 gives Output=1. On the other hand, Input 1=0 AND Input 2=1 gives Output=0: the AND condition has not been met. The other types of digital circuits performed similar functions.

■ So How Do AND Gates Give You CD Audio or DSP?

Well, truthfully, they don't. A few more revolutions in electronics were required. The number of devices, such as logic functions, that could be integrated on a single chip of silicon increased wildly through new manufacturing techniques. The number of transistors per chip rose from hundreds, to tens of thousands, to hundreds of thousands and beyond, over a ten-year period.

With this increase, designers started thinking at a system level, not just the logic gate level. Whole digital systems which provided major circuit functions were now capable of being made on a single chip. Enter the microprocessor, with its even higher level of complexity.

As speeds of computing got faster, the possibility of changing a signal into a digital representation of ones and zeros in real time, instead of a mechanical movement, became a reality. Circuits called ADC (analog to digital converters) and the reverse, DACs, were developed which do just what their names say. (This was the start of us throwing out all of our prized LP record collections!) In our Compact Disc systems, audio signals are digitized (ADC) and encoded in light patterns on a disc. During playback a laser reads the ones and zeros from the disc and this digital signal is converted back to analog (DAC) for us to hear.

■ Why All This Converting and Re-Converting?

Good question. In the analog world in which we humans live it is sometimes difficult to impossible to pick out the intended communication from the accompanying noise. Try speaking to someone on a telephone while a fax or modem is competing for the line! In the digital world you have the ability to define programs, or algorithms, which can do a great job of separating signal from noise, or one type of signal from another. This brings us the "hiss and pop"-free listening of CDs.

In communications this allows the signal to be processed and filtered in lots of different ways tailored to our exact applications: USB, CW, AM, or custom digital coding. All this is done in software with no additional electronic circuits or components. This wide flexibility of filtering and signal manipulation makes Digital Signal Process (DSP), very, very powerful.

■ Back to the Present (and Future)

First the local oscillator's inexact tuning was replaced by highly accurate, digital frequency synthesizers. A number of manufacturers have been tuning their radios using frequency synthesizers for many years. One of the first consumer radios to utilize it was the Sony ICF-2001 in 1981.

Since that time the synthesizer has become commonplace in receivers. Companies are still learning how to make them less interfering (quieter), designing them with wider/higher frequency range and lower power consumption.

The Collins' designers utilized this knowledge to design a modulated fractional division (MFD) synthesizer. This is the heart of their 0.005 to 2000 MHz, 95S receiver; with tuning in 1 Hz increments. Stability is also impressive at +/- 1 part per million over the temperature range of 0 to 50 degrees Celsius. The spec sheet for the 95S indicates that internal spurious signals, such as those from a noisy synthesizer, are very low at -115 dBm.

DSP, until recently, has been only for the military and high-end professional users. Some ham equipment manufacturers began using limited DSP techniques a few years ago. But within the past eighteen months, full-blown DSP has become an economically feasible choice for communication designers.

Collins' 95S makes extensive use of DSP in getting the signal to the user. Looking at Figure One, we can now recognize and understand the functions of the ADC, DAC, and DSP blocks. This is the source of the very wide range of bandwidths available on the 95S (down to 100 Hz), and the "downloadable filters" the datasheet mentions. The picture of the 95S shows exactly how vital a computer has become in the monitoring world. The metal box sitting next to the laptop computer is the 95S—not a control knob in sight.

Add to all this an internal tracking preselector which operates from 20 to 2000 MHz and the use of high speed, low noise, Gallium Arsenide mixers, and the 95S is the result.

■ Did He Say New Technology?

With all this innovative, recently developed methodology, surely the rest of the 95S' circuits must rely on newly-developed radio frequency circuitry? Here's where you may be surprised.

The Homodyne or Direct Conversion Receiver (DCR) approach, which the 95S uses in the RF section, is about sixty years old. A number of ham transceivers have used DCR in the past few years with mixed results. Remember, we said at the beginning of this article that DCR was a competitor of the superhet way back when! What worked poorly with the existing technology of that day, does an outstanding job when coupled with modern technological advances. Maybe a good lesson for so-called modern man is, "Don't discount old ideas without first updating them with new information."

■ The Future is Now

Going by the datasheet, the performance promised by the 95S could only be dreamed of a few years ago, for any price. Professional, government, and military users are comfortable with paying in the $15,000 range for receivers with much less capability.

The 95S has been introduced at a price around the $5000 mark; still too expensive for most *MT* readers. But remember when Apple and Atari computers, now under $100, sold for $1000? If wireless markets such as cellular data and telephone continue their wild and rapid growth, the rest of the communications market segments, such as ham and monitoring, will reap the rewards of their leaps in performance and reductions in cost.

Collins is not the only manufacturer exploring the digital approach to radio. Several other competitors have already entered the field; but, for now at least, the Collins 95S may be one of the most revolutionary communications products about to become available to *MT* readers.

For more information and availability, contact Collins Avionics and Communications Division at (800) 321-2223 or (319) 395-5100.

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The HF Communications Spectrum

Larry Van Horn, N5FPW
mt@grove.net

Coast Guard Pacific Operations

This month we are going to journey into the Pacific and take a look at the U.S. Coast Guard Communications Area Master Stations Pacific (CAMSPAC), call sign NMC, at Point Reyes, California, along with some other Coast Guard stations along the Pacific rim.

The original Coast Guard San Francisco Radio 'NMC' was commissioned in 1937, and was located at Fort Funston near Golden Gate Park. It served the Coast Guard's 12th Division, worked radiotelegraph traffic from ocean station cutters and civil aviators in the early days of transpacific aviation, and provided a training ground for journeyman Radiomen (RM's).

In 1943 it was relocated to a site atop Mt. San Bruno. Communication Station (COMMSTA) San Francisco went on the air for the first time from its current location at Point Reyes on October 12th, 1972. The station was designated the Pacific Area Master Station and was renamed CAMSPAC in 1986. Today the station exercises overall control of the Coast Guard Pacific Area Communication System which includes the Communication Stations located at Kodiak, Alaska; Honolulu, Hawaii; and the transmit and receive facilities at Guam in the Marianas Islands.

NMC Mission and Technical Information

CAMSPAC San Francisco is under the operational control of Commander, Pacific Area. Administrative and technical control is exercised by the Commander, Maintenance and Logistics Command-Pacific. Operational support is extended to the 11th, 13th, 14th and 17th Coast Guard Districts in the form of remote medium and high frequency coverage, and broadcast services. Communication services are provided to all Pacific area operational commanders, mobile units, and other government agencies. Functioning as the Coast Guard Communication Area Master Station for the Coast Guard's Pacific Communication System (PACCOMMSYS), CAMSPAC's primary missions include:

- Providing a reliable, secure, and rapid means of exercising command, control, and coordination of Coast Guard operations within the PACCOMMSYS. This is provided in the form of voice, radioteletype, High Frequency Data Link (HFDL), Inmarsat-C, and radiotelegraph service between operational commanders ashore and mobile units.
- Guarding specified international distress frequencies and responding to emergency signals and requests for medical advice.
- Providing a means by which international maritime and aeronautical commerce and the boating public may communicate with U.S. government agencies ashore.
- Providing communication support for National Marine Fisheries Service, National Oceanographic and Atmospheric Administration, Military Sealift Command, and other government maritime activities.
- Broadcasting weather, and hydrographic information, storm warnings, and notices to mariners.
- Providing facilities and personnel to receive and relay AMVER and weather observation messages from government and non-government ships at sea.

CAMSPAC San Francisco consists of three geographically-separated sites. The receiver site is located within Point Reyes National Seashore; the transmitter site is near the town of Bolinas; and the public works complex and family housing site is in the town of Point Reyes Station.

CAMSPAC's receiver site utilizes Harris R2368 receivers patched to ten receive antennas, one Raycal Decca NAVTEX receiver, and one Thrane & Thrane capsat TT-3020B Inmarsat-C receiver. Several different computer systems relay message traffic as well as control receivers and transmitters.

The transmitter site is equipped with 20 Rockwell/Collins HF80 series 10 kW HF transmitters, two Nautel MF transmitters, and 15 separate transmit antennas. In addition, CAMSPAC remotely operates transmitters at sites in Southern California, Oregon, and Guam.

The receiver site is manned 24 hours a day by four watch sections of 11 persons each. The transmitter site is manned 24 hours a day by two technicians. CAMSPACs complement between the three sites consists of five commissioned officers and 89 enlisted personnel.

Here is a list of the maritime safety information (MSI) broadcast, radiotelephone, and radiotelex frequencies used by Pacific rim Coast Guard stations (times UTC, freqs kHz).

Messages on these frequencies include such traffic as Urgent Marine Information Broadcasts, Weather Forecasts, Broadcast Notice to Mariners, and Satellite and Omega Navigational Advisories.

Maritime Safety Information (MSI) Broadcasts

MSI NAVTEX Broadcasts (All NAVTEX broadcasts are on 518 kHz)
NMC-CAMSPAC San Francisco, California

Three NAVTEX Frequency Shift Keying (FSK) transmitters are operated from CAMSPAC at the times listed below:

W	Ft Stevens, OR	0130, 0530, 0930, 1330, 1730, 2130
C	Pt Reyes, CA	0005, 0400, 0800, 1200, 1600, 2000
Q	Cambria, CA	0045, 0445, 0845, 1245, 1645, 2045

NMO-Communication Station Honolulu, Hawaii

A NAVTEX FSK transmitter is operated from Wahiawa:

O	Lualualei, Oahu, HI	0040, 0440, 0840, 1240, 1640, 2040

NOJ-Communication Station Kodiak, Alaska

Two NAVTEX FSK transmitters are operated from this station:

J	Kodiak, AK	0300, 0700, 1100, 1500, 1900, 2300
X	Adak, AK	0340, 0740, 1140, 1540, 1940, 2340

MSI Voice Broadcasts
NMC-CAMSPAC San Francisco, California

Three high frequency single sideband transmitters are operated simultaneously by voice synthesizing equipment at CAMSPAC :

Channel	Frequency	Times
424	4426.0	
816	8764.0	0430, 1030 (4/8/13 MHz)
1205	13089.0	1630, 2230 (8/13/17 MHz)
1625	17314.0	

A medium frequency single sideband transmitter is operated by voice synthesizing equipment at CAMSPAC on the following frequencies:

Calling	Frequency	Frequency Times
2182.0	2670.0	0203, 1403

NMO-Communication Station Honolulu, Hawaii

Two high frequency single sideband transmitters are operated simultaneously by voice synthesizing equipment at Wahiawa:

Channel	Frequency	Times
601	6501.0	0600, 1200 (6/8 MHz)
816	8764.0	0000, 1800 (8/13 MHz)
1205	13089.0	

NOJ-Communication Station Kodiak, Alaska

A high frequency single sideband transmitter is operated by voice synthesizing equipment:

Channel	Frequency	Times
601	6501.0	0203, 1645

MSI Facsimile Broadcasts

Two high frequency radio facsimile transmitters are operated simultaneously from NOJ at frequencies and times indicated:

Assigned	Carrier	Times
4298.0	4296.1	0000, 1800
8459.0	8457.1	1800, 2200

MSI TELEX Frequencies

NMC-CAMSPAC San Francisco, California

Two high frequency radio telex transmitters are operated simultaneously by forward error correcting (SITOR-B) modems at CAMSPAC:

Assigned	Carrier	Times
8416.5	8414.8	0000, 1800 (8/16 MHz)
16806.5	16804.8	

NRV-Guam, Marianas Islands

Three high frequency radio telex transmitters are operated simultaneously by forward error correcting (SITOR-B) modems on Guam:

Assigned	Carrier	Times
12579.0	12577.3	1500, 1900, 2315 (12/16/22 MHz)
16806.5	16804.8	0230, 0500, 0900 (12/16/22 MHz)
22376.0	22374.3	

NMO-Lualualei, Hawaii

Three high frequency radio telex transmitters are operated simultaneously by forward error correcting (SITOR-B) modems from NMO:

Assigned	Carrier	Times
8416.5	8414.8	0130 (8/12/22 MHz)
12579.0	12577.3	0330, 0430, 0630, 0730, 1330 (8/12MHz)
22376.0	22374.3	1730, 2030, 2230 (8/12/22 MHz)

■ Radiotelephone Frequencies

Digital Selective Calling (DSC) has not been implemented at any of the Pacific Coast Guard stations. A watch is kept as indicated by the Watch column: H24=continuously, HN=night, HJ=day, O/R=on request. All frequencies are carrier frequencies.

NMC-CAMSPAC San Francisco (DSC ID: 003669990)

Channel	Ship	Shore	Watch
N/A	2182.0	2182.0	H24
424	4134.0	4426.0	H24
601	6200.0	6501.0	H24
816	8240.0	8764.0	H24
1205	12242.0	13089.0	H24

NMO-Communication Station Honolulu, Hawaii (DSC ID: 003669993)

Channel	Ship	Shore	Watch
424	4134.0	4426.0	HN
601	6200.0	6501.0	H24
816	8240.0	8764.0	H24
1205	12242.0	13089.0	HJ

NOJ-Communication Station Kodiak, Alaska (DSC ID: 003669899)

Channel	Ship	Shores	Watch
N/A	2182.0	2182.0	H24
N/A	4125.0	4125.0	H24
601	6200.0	6501.0	H24

■ Radiotelex Frequencies

An automated watch is kept at all stations. After answerbacks are exchanged, the shipboard operator prepares the system to store and forward each telegram. H24=continuously, HN=night, HJ=day. All frequencies are assigned frequencies.

NMC-CAMSPAC San Francisco, California (Selcall ID: 1096)

Channel	Ship	Shore	Watch
620	6272.5	6323.5	HN
820	8386.0	8426.0	H24
1620	16693.0	16816.5	HJ

NMO-Communication Station, Honolulu, Hawaii (Selcall ID: 1099)

Channel	Ship	Shore	Watch
827	8389.5	8429.5	H24
1220	12486.5	12589.0	H24
2227	22297.5	22389.5	HJ

NOJ-Communication Station Kodiak, Alaska (Selcall ID: 1106)

Channel	Ship	Shore	Watch
47	4175.5	4213.5	HN
67	6266.0	6317.5	H24
87	8379.5	8419.5	HJ

The station on Guam is operated remotely by CAMSPAC San Francisco, California using the Selcall ID: 1096.

Channel	Ship	Shore	Watch
812	8382.0	8422.0	H24
1212	12482.5	12585.0	HN
1612	16689.0	16812.5	H24
2212	22290.0	22382.0	HJ

Radiotelephone and radiotelex messages pertaining to certain prescribed medical, safety, weather, or U.S. government matters are relayed by the above Coast Guard stations free of charge.

I would like to thank the U.S. Coast Guard Public Affairs Office and Coast Guard Frequency Management Office for their assistance in preparing this month's Utility World column on Coast Guard stations in the Pacific

■ Ooopppsss!!!

Following are a couple of corrections to the September column. In that column we gave the date for the 500+ character EAM as April 19, 1995. That should have read *May* 19, 1995. Of course, as was pointed out by a couple of eagle-eyed Ute World readers there *was* something significant that happened on April 19: the Oklahoma City federal building bombing. Also in that column the bullet information about the upgrades to the TACAMO aircraft was courtesy of *Aviation Week and Space Technology*.

Now it is time to see what you having been hearing this month in the world of utility listening.

Utility Loggings

Larry Van Horn

Abbreviations used in this column

Aeroradio	Aeronautical Radio Station
AM	Amplitude Modulation
ARQ	Synchronous transmission and automatic repetition teleprinter system
ARQ-E	Single channel ARQ teleprinter system
ARQ-E3	Single channel ARQ ITA3 teleprinter system
ARQ-M2/4	Multiplex ARQ teleprinter system with 2 or 4 data channels
ASECNA	Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar
CG	Coast Guard
CNA	Central News Agency, Inc
COE	Corps of Engineers
CW	Morse Code
DPA	Deutsche Presse Agentur
DOT	Department of Transportation
DSN	Defense Switching Network
Fax	Facsimile
FCC	Federal Communications Commission
FEC	Forward Error Correction
FEC-A	One-way traffic FEC teleprinter system
FEMA	Federal Emergency Management Agency
FF	French Forces
FHWA	Federal Highway Administration
f/v	Fishing Vessel
GHFS	Global HF System
HF	High Frequency
ID	Identification
HMAS	Her Majesty's Australian Ship
HNG-ARQ	Hungarian diplomatic ARQ teleprinter system
KCNA	Korean Central News Agency
LDOC	Long Distance Operational Control
LSB	Lower Sideband
MARS	Military Affiliate Radio System
Meteo	Meteorology
MFA	Ministry of Foreign Affairs
MOD	Ministry of Defense
m/s	Merchant Ship
m/t	Motor Tanker
m/v	Motor Vessel
NW	Nightwatch
Pactor	Teleprinter system combining certain characteristics of packet radio and SITOR.
PIAB	Presse- und Informationsamt der Bundesregierung
RAF	Royal Air Force
R/T	Radiotelephone
RTTY	Radioteletype
SAM	Special Air Mission
SAR	Search and Rescue
Selcal	Selective Calling
SITOR	Simplex teleprinting over radio system
SITOR-A	Simplex teleprinting over radio system, mode A
s/v	Sailing Vessel
SWED-ARQ	Adaptive Swedish diplomatic simplex ARQ teleprinter system
Twinplex	Four-frequency diplex teleprinter system
Unid	Unidentified
U.S.	United States
USA	U.S. Army
USAV	U.S. Army Vessel
USB	Upper Sideband
USCG	U.S. Coast Guard
USN	U.S. Navy
USS	United States Ship
VA	Veterans Administration

All times are in UTC, all frequencies in kHz, and all transmissions are in USB unless otherwise indicated

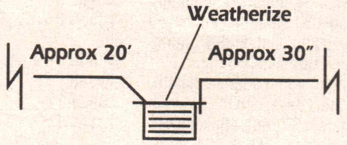
2614.0	DAN-Norddeich Radio, Germany, working DDIF-m/v *Diana Maria* at 1848. (Robin Hood-UK)
2690.5	Grengel Meteo, Germany, with coded weather in 100 baud RTTY at 1856. (Hood-UK)
2839.0	Unid German Navy or CG vessel working CG vessel *BG22 Neustrelitz* at 0620. (Ary Boender-Netherlands)
2840.7	DLVH-German CG customs launch *Glueckstadt* working Cuxhaven CG, Germany, with position report at 1932 using SITOR-A. DBQR-Wasserschutzpolizei vessel *Niedersachsen 4* working German CG Cuxhaven with position report in SITOR-A at 0533. (Boender-Neth)
2962.0	New York Aeradio, NY, working Portugal 317. 317 reports he is at 290-New York literally screams "Go to 310 NOW!" at 0043. (Fred Dodge-Albany, NY) *Sounds like a near mid-air to me-Larry.*
3451.5	21-Irish navy vessel working 0A-Dublin, Ireland, with routine SITOR-A messages at 2222. (Boender-Neth)
3617.9	N0FBW-USN MARS with SITOR-A message at 1010. (Fred Hetherington-Ormond Beach, FL)
4050.0	Spectre Ops periodically calling Jaws 53 (at the request of Jaws 53 when they were on 11175.0), but no response at 0204. (Jeff Haverlah-Houston, TX)
4098.0	ELJV7-M/S *Nordic Empress* working WOM with radiotelephone traffic at 0250. 3ECW2-M/V *Ayogalusena* working WOM with radiotelephone traffic at 0516. (Jim Navary-Colonial Heights, VA)
4211.5	KFS-Palo Alto, CA, with SITOR-B CQ marker at 2138. (James Calloway-Imlay, NV)
4216.0	KPH-San Francisco Radio, CA, with CW marker at 2141. (Calloway-NV)
4218.5	YLQ-Riga Radio, Latvia, with SITOR-A transmissions at 0030, new call sign. (Hetherington-FL)
4629.0	Unid ground station with VIP phone patch traffic for XLR949 at 0125. Any ideas? (Ed Rausch-NJ) *My best guess based on call sign is a Canadian channel-Larry.*
5015.0	WUE5-USA COE Louisville, KY, net control for Ohio River division. Also heard WUO-Unknown location (*Washington, DC-Larry*) and WUE5513-a mobile in the field somewhere. COE channel 2 at 1500. (Jack Metcalfe-KY)
5329.6	AEAD-USAV *Lipscomb* with radiograms for WUG, WUG2 and AEEB at 1405 in SITOR-B. (Metcalfe-KY)
5424.0	Oakwood working Darkbrew at 1150 then switched to frequency foxtrot. (Harry Riddell-Rochester, NY) *The CG is the only thing I've seen reported here recently-Larry.*
5571.0	Moody Ops working 1236F on frequency ID'ed as "frequency 2". Sign off by Moody was KTG7-Moody Ops at 1320. (Riddell-NY) *This is Moody Aviation in Elizabethton, TN-Larry.*
5649.0	Turkish Air 582 (Selcal ER-CD) working Gander, NF, at 0124. (Navary-VA)
5680.0	Edinburgh Rescue, UK, working RAF helicopter VLL91 with radio check at 0912. (Boender-Neth)
5696.0	USCG St Thomas, VI, relieving CG 1712 from SAR ops and securing radio guard at 2330. (Rausch-NJ)
5717.0	CFH-Halifax Military, NS, with SAR comms at 2353. (Rick Baker-Autintown, OH)
5798.4	Pactor and SITOR-A alternating here at 1356. I believe this is a USN MARS frequency. (Metcalfe-KY) *It is-Larry.*
6151.0	WGY966-FEMA Conway, AR, working WGY906-FEMA Denton, TX at 1647. Communications concerned lost long distance circuits. I don't think this was an exercise. (Metcalfe-KY) *Nice place to hide-Larry.*
6691.0	Molecule working Cockfight with mentions of California. Both station were coordinating the current time via taped time pip then went secure voice at 2030. (Riddell-NY) *US Navy air to ground channel-Larry.*
6712.0	Reach 127VW working Andrews GHFS, MD, (North America site for sure) with phone patchs to Dover at 0553. (Haverlah-TX)
6714.0	Jolly 12 working command post at 0054. (Navary-VA)
6730.0	Guidepost (female op) periodically simulcasting EAMs to the net on 6730, 6739 and 11244. After 0500, same op ID'ing as Guidepost 01 calls 02. About 20 minutes late, same female op, this time ID'ing as Guidepost 02 works Guidepost 01 with Guidepost 01 exiting the net through the challenge process. This suffix stuff is very new. (Haverlah-TX)
6739.0	7CT working Lajes GHFS, Azores (and also co-channel E[zero]E) with phone patches to NAVCOMSTA Kevlavik, Iceland (aka NCTS Iceland, NTCS Ice) regarding proper ship/shore Northern Net frequencies, using NUCO/UNUCO procedures, but talking about 4 and 8 megger ranges plus 227.5 MHz. (Haverlah-TX)
6761.0	Soda 66 calling Soda Control at 1310. (Riddell-NY)
6835.0	Repairman 26 working 26S confirming full power status at 1925. (Riddell-NY) *I have seen this call before and believe that this traffic is related to Portsmouth Naval Shipyard comms. Probably a ship on sea trials-Larry.*
6960.0	M16 Linconshire poacher number station in AM at 0200. (John Bellovich-Macclenny, FL)
6993.0	SAM 200 working Andrews, MD (Mystic Star) at 2307. (Les Butler via Grove BBS)
7500.0	Beadstorm working Victorious at 2330. (Bob Grove-Brasstown, NC) *Probably a US Navy tactical net-Larry.*
7610.0	Rolling code speech inversion noted at 2325. (Grove-NC)
7650.0	Several stations in LSB talking about maintenance and parts orders (no calls given) at 2345. (Grove-NC) *I believe this is a US Army net, Bob-Larry.*
7801.0	Several stations passing MARS type traffic at 0000. (Grove-NC) *Nothing on my list; readers?-Larry.*
7997.1	SOH299-Warsaw Meteo, Poland, with 50 baud RTTY parallel to SOE349 which was not audible here at 2200 on 4497. (Hetherington-FL)
8032.0	Unid base station working Alpha-Alpha, talking about tanker over Israel, mentioned Boss on board at 0518. (Dodge-NY) *Interesting call sign, this is a Mystic Star frequency-Larry.*
8080.0	NAM-USN Norfolk, VA, with a fax chart at 0457. (Calloway-NV)
8122.0	VKPR-HMAS *Protector*, VKMY-HMAS *Flinders*, VLRO-HMAS *Bunbury* (P-217), and VLRE-HMAS *Whyalla* all working Canberra Control. VKLP-HMAS *Melbourne*, VMLC-HMAS *Collins*, and HMAS *Brunei* working Darwin Control. (Navary-VA)
8198.0	WQZ6605-*Coastal Pensacola*, 3EWK9-*Fascination*, and C6KP-*Festivale* working WOM. 6MNJ-Unknown ship and 3EKS8-*Lagos No. 103* working VIS. All for R/T traffic. (Navary-VA)
8204.0	ELFK6-m/s *Jubilee* (Carnival Cruise Lines) working WOM for R/T traffic at 0437. (Baker-OH)
8210.0	C6KW4-m/v *Alcinoe* working VIS with R/T traffic at 0817. (Navary-VA)
8234.0	3EWK9-m/s *Fascination* (Carnival Cruise Lines) with WOM R/T traffic. (Baker-OH)
8279.0	6KRV-f/v *Dong Won 606* working VIS with R/T traffic at 0618. (Navary-VA)
8294.0	PJWW-Unknown ship calling PGON-*Orange Clipper* at 0016. (Navary-VA) *Jim my records show that PJWW is the m/v* Fairlane-*Larry.* AAOU-USAV *Manassas* (LCU-1667) at 0258 working Raider Base (1097th Trans Co, Rodman Naval Station, Panama) with position report. (Baker-OH)
8297.0	WBZ7624-*Good Time Diver* calling their base at 0111. AAFA-USAV *SP4 James A. Loux*, AADX-USAV *Buena Vista* (LCU-2008), AADT-USAV *Aldie* (LCU-2004) and AADU-USAV *Brandy Station* (LCU-2012) at various times working AAC2-Ft. Eutis, VA. Viking Ops working AAEB-USAV *Chickasaw Bayou* at 1106. Who is Viking Ops? (Navary-VA) *I don't have a clue; readers?-Larry*
8350.0	S6AH-m/v *Zim San Juan* sending an AMVER message in CW at 0150. PPVH-m/t *Marta* working PPJ in CW at 0201. (Navary-VA)
8377.5	UTVT-TH *Taras Shevchenko* at 2306 with SITOR-A message. (Baker-OH)
8381.0	YLBM-m/v *Tavala* calling Riga Radio using SITOR-A at 1803. (Boender-Neth)
8382.5	UVYH-TH *Sumy* (bulk carrier) at 0442 in SITOR-A with traffic for Mariopol Radio. (Baker-OH)

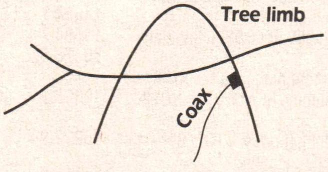
8396.5	KCGH-SS *Kainalu* working WSLH-SS *Maui* in SITOR-A at 0420. Both vessels from Matson Navigation. (Navary-VA)
8399.0	C6BP9-m/v *Forest Hills* with arrival message using SITOR-A at 1834. (Boender-Neth)
8403.0	UWRH-Unid vessel working Kaliningrad Radio at 1818 in SITOR-A. (Boender-Neth)
8404.0	UROS-T/H *Dnepr* working USO5-Izmail Radio in 50 baud RTTY at 0838. (Hood-UK)
8477.7	FUF-FF Fort de France, Maritinque, with RTTY test tape at 0515. (Calloway-NV)
8494.0	Royal Navy fleet broadcasts using 100 baud RTTY at 1447. (Boender-Neth)
8570.0	RSGV/UUA9-Petrozavodsk Radio, Russia, working ENWK-T/H *Morskoy 1* in CW at 1520. RSGV/UUA9 operated by White Sea and Omega Shipping Co. (Hood-UK)
8680.0	URB7-Unknown station calling EMON-T/H *Novoangarsk* and was listening 12434.0, no reply. In CW at 1331. Any ideas? (Hood-UK) *None here-Larry.*
8704.5	UGW-Novorossiysk Fisheries Radio, Russia, with traffic list and working UGVJ-RTMS *Navigator* (on 12567.0) in CW at 1715. (Hood-UK)
8746.0	SP041-Szczecin Radio, Poland, with voice traffic list at 1435. (Boender-Neth)
8764.0	GKU46-Portishead Radio, UK, at 2101 with traffic list. (Baker-OH)
8924.0	Dublin LDOC (Aer Lingus), Ireland, at 2346 working unid aircraft. (Baker-OH)
8968.0	L0Z working Thule GHFS, Greenland, with phone patch to 7VJ at DSN 314-624-5361 at 2216. (Vlismas-UK)
8971.0	Blue Star (USN Facility, Caribbean) at 2206 working Falcon 01 (also ID'ed as 501) who advised switching to frequency Bluebell for safety of flight comms. (Baker-OH)
9017.0	NW01 net with WAR46, Transfer, Overrule, also on 5800 at 0302. (Haverlah-TX)
9052.0	KIA85-FCC Vero Beach, FL, with a NTMS/NTCN exercise message for KIA84-FCC Powder Springs, GA. At 1533 and this frequency is NC10 or NC12. (Metcalfe-KY)
9860.0	Spanish female 5-digit number station in AM at 0240 (Friday UTC). Robert Thompson-Kilgore, TX)
10192.0	DRAT-FGS Emden (F-210) calling DHJ59 at 0419, no joy. (Navary-VA)
10300.2	Unid Moscow Meteo, Russia, frequency in Twinplex mode, unable to decode at 1546. (Robert Hall-Capetown, South Africa)
10411.8	Egyptian Embassy Paris, France, with SITOR-A Arabic message traffic at 1730. (Hall-RSA)
10588.0	LSA calling LSF, but reaching LSC at 1617. FEMA frequency, but I'm sure these weren't FEMA stations. (Metcalfe-KY) *This is been reported to be a VA-FEMA net channel. Wonder if these are VA station calls-Larry?*
10891.0	KWB406-DOT Ames, IA, working WWJ85-FHWA Ames, IA, at 1500. Also attempted Pactor communications. (Metcalfe-KY)
10955.0	RFTJF-FF Port Bouet, Ivory Coast, with ARQ-E at 0015, use to be ARQ-E3. (Hetherington-FL)
10993.5	USN station Z7J asking J1X if he was green (secure) capable on uniform (UHF) at 1430. (Metcalfe-KY) *Jack, I have also seen the CG on this one-Larry.*
11011.0	Unid stations, possibly identifying as 06 and 220, testing radio equipment onboard an aircraft. Went secure a couple of times at 1943. (Metcalfe-KY)
11142.3	KRH50-Unid, U.S. Embassy in London?. With 75 baud RTTY at 1757. (Hall-RSA) *Robert, that is what is on my list-Larry.*
11175.0	Sled 75 working Ascension GHFS with phone patch to DSN 527-xxxx (Base Ops). Inquired about the status of NASA 831 (an SR-71) at 0059. Muroc 25 working Ascension GHFS with a phone patch to Muroc Ops at DSN 527-xxxx at 2210. Navy PJ-883 (the old Crawfishers in the Big Easy-Larry) working Ascension GHFS with phone patch to DSN 363-xxxx at 2237. (Navary-VA) Pinkerton calling NW and Rotarian at 1713. (Duke Rumley-Madison-NC) Doom 69 working Ascension GHFS with phone patch to Raymond 6 at 2130. Vader 54 working Ascension GHFS with phone patch to DSN 346-1315 at 2221.(Vlismas-UK)
11396.0	New York Aeroradio, NY, working N747UP (BAE125 of Union Pacific Railroad) at 1728 [CAR-A MWARA]. (Baker-OH)
11342.0	Cubana 471 calling New York Aeradio, NY, at 2111, no joy. (Navary-VA)
11343.0	YOFN-Unid station working VY13, sent "GIH PPVF GIH PPVF QCO?" then "185 185 30080005 GIMJ" in CW at 2125. (Navary-VA)
12070.0	WUJ4-USACOE Walla Walla, WA, at 1533 working WUG-USACOE Vicksburg, VA with "Friday check in net on channel 10." (Baker-OH)
12122.0	WUB2-USACOE New York District at 1542 working WUG "for Friday check in net on channel 11." WUJ4 (above), WUA-Whitman, MA, WUE5-Louisville, KY, also on. (Baker-OH)
12156.0	English female 3-digit number station in AM under WWCR. (Thompson-TX)
12165.0	RKB78-Moscow Meteo, Russia, with two very clear fax charts at 1711. (Hall-RSA)
12172.2	PWR-Brasilia Naval Radio, Brazil, with 75 baud RTTY 5-letter groups at 1552. (Hall-RSA)
12204.1	SNN299-MFA Warsaw, Poland, with POL-ARQ traffic at 1120. ZSO2/3-South Africa Hydrosan with 72 baud RTTY RY's and NAVAREA 7 warnings at 1559. (Hall-RSA)
12236.0	PC8024-s/v *Rainbow Warrior* working VIS with R/T traffic at 0527. This is the Greenpeace ship. (Navary-VA)
12245.0	NRLC-USS *Conolly* (DD-979) calling WOM at 1411. (Navary-VA)
12248.5	5NOL-m/v *Bonny* working Sudmaritime Douala using SITOR-A at 1127. (Hall-RSA)
12267.0	WUH5-USACOE Kansas City, NE, at 1540 calling WUG (Friday net). (Baker-OH)
12272.0	WBR9448-*Conquista* working WOM with R/T traffic at 1435. (Navary-VA)
12320.0	J8DK5-f/v *Astro No. 7* working VIS with R/T traffic at 0547. (Navary-VA)
12453.0	SVDE-m/v *Merini* working SVD in CW at 1803. (Navary-VA)
12524.0	LYDA-m/v *Kreva* working LYK-Klaipeda Radio in 50 baud RTTY at 1247. (Hood-UK)
12548.0	UEXC-T/H *Sormovskiy 27* working IAR-Rome Radio from Mariupol roads with message for Cyprus. CW at 0936. This frequency is normally a telex channel. (Hood-UK)
12611.5	KEJ-Honolulu Radio (Globe Wireless Station), HI, with CW marker/tuning signal then at 0416 into SITOR-B with info about Globe Wireless station, then traffic list. (Navary-VA)
12879.0	WSC-Tuckerton Radio, NJ, with CQ CW marker at 0020. (Calloway-NV)
13030.0	UGC-St. Petersburg Radio, Russia, working UTXF-T/H *Nadezhda Krupskaya* in 50 baud RTTY at 1750. (Hood-UK)
13042.5	FUV-French Naval Radio, Djibouti, with ID and RY/SG test tape in 75 baud RTTY at 1753. (Hood-UK)
13155.0	OHG-Helsiniki Radio, Finland, working J8HC6-m/v *City of Sochi* at 1255. Vessel is Russian owned. (Hood-UK)
13428.0	English female with 3-digit number groups in AM at 0038. (Calloway-NV)
13580.0	KCNA Pyongyang, North Korea, with French news using 50 baud RTTY at 1245. (Hall-RSA)
13846.8	RFQP-FF Djibouti, with ARQ-E3 transmission at 1202. (Hall-RSA)
13848.7	RFFXL-FF Naqoura, Lebanon, with ARQ-E idling at 1722. (Hall-RSA)
13977.7	FDZ/RFFP-FF Paris , France, with ARQ-E3 at 1900. (Hetherington-FL)
14141.1	Moscow, Russia, with ALIS system, unable to decode at 1717. (Hall-RSA) *What is this, Robert?-Larry*
14441.5	U.S. Navy MARS afloat stations NNN0CBV-USS *Canopus* (AS-34), NNN0ADV-Unid ship, and NNN0CYL-USS *Kidd* (DDG-993) working various stateside stations for traffic. (Navary-VA)
14584.1	Zaire bank circuit with 50 baud RTTY French traffic at 1139. (Hall-RSA)
14684.7	Zaire bank circuit with SITOR-A French traffic at 1150. (Hall-RSA)
15878.0	3MA24-CNA Taipei, Taiwan, with fax newspaper in Chinese at 0950. (Hall-RSA)
15898.2	RFGW-MFA Moscow, Russia, with 367 5-letter groups using FEC-A at 1306. (Hall-RSA)
15922.9	DGP92-PIAB Bonn, Germany, with German news at 1235 using FEC-A. (Hall-RSA)
16000.5	UPVE-Russian ship BATM *Sokolniki* working Kaliningrad Radio in 50 baud RTTY at 1208. (Hall-RSA)
16018.0	DFQ21-PIAB Bonn, Germany, with German news and exchange rates using FEC-A at 1553. (Hall-RSA)
16107.0	SAM-MFA Stockholm, Sweden, with SWED-ARQ traffic in Swedish to Addis Ababa embassy at 1212. (Hall-RSA)
16118.0	HBD20-MFA Berne, Switzerland, with German news using SITOR-A at 1540, parallel to 16120.0. (Hall-RSA)
16224.2	3MA25-CNA Taipei, Taiwan, with English news at 0958 using 50 baud RTTY. (Hall-RSA)
16280.0	RFQP-FF Djibouti, with traffic on channels A and B using ARQ-M2 at 1555. (Hall-RSA)
16280.3	RFFTA-MOD Paris, France, with 5-letter groups on channel B using ARQ-M2 at 1723. (Hall-RSA)
16305.8	RFPTC-FF N'Djamena, Chad, idling using ARQ-E3 at 1019, listed as ARQ-M2-200. (Hall-RSA)
16339.6	CJL-MFA Nicosia, Cyprus, with RY/ID test tape using 96 baud RTTY at 1145. (Hall-RSA)
16339.7	CJL-MFA Nicosia, Cyprus, with ARQ-E test tape at 1148, changed from RTTY to ARQ-E. (Hall-RSA)
16453.4	HGX-MFA Budapest, Hungary, with HNG-ARQ at 1545, unable to decode. (Hall-RSA)
16802.6	UPPY-BATM *Nivenskoe* working Kaliningrad with 50 baud RTTY at 1135. (Hall-RSA)
16803.5	ENHY-TH *Timofevsk* working Sevastopol with 50 baud RTTY (reverse polarity) at 1521. (Hall-RSA)
16803.5	UYTB-RTMKS *Rybak* working Kaliningrad with 50 baud RTTY at 0928. (Hall-RSA)
17135.0	UTQ-Kiev Radio, Ukraine, with CW ID marker at 1302. (Hall-RSA)
17400.2	5ST-ASECNA Antananarivo, Madagascar, with 100 baud RTTY RY/ID test tape at 1240. (Hall-RSA)
18047.5	English female number station with "278 278 278" repeat then 10 count at 1205. (Hall-RSA)
18276.8	HBD20-MFA Berne, Switzerland, with SITOR-A German news at 1234. (Hall-RSA)
18345.2	DMK-MFA Bonn, Germany, using 75 baud RTTY at 1124, unusual mode, normally ARQ-E. (Hall-RSA)
18388.7	5AF-Tripoli Air. Libya, with 50 baud RTTY test tape at 1215. (Hall-RSA)
18487.9	MFA Oslo, Norway, with twinplex transmission, unable to decode at 1227. (Hall-RSA)
18688.1	SAM-MFA Stockholm, Sweden, with SWED-ARQ transmission of 5-letter groups and traffic to Swedish embassy in Addis Ababa at 1303. (Hall-RSA)
18697.7	DPA Bonn, Germany, with German news to South America using FEC-A at 1201. (Hall-RSA)
19218.2	SAM-MFA Stockholm, Sweden, with SWED-ARQ traffic to Luanda embassy at 1209. (Hall-RSA)
19693.5	UFN-Novorossiysk Radio, Russia, signing CW/SITOR-A at 1600. (Hetherington-FL)
19699.0	UFN-Novorossiysk Radio, Russia, signing CW/SITOR-A at 1505. (Hetherington-FL)
22461.0	FUJ-French Navy Noumea, New Caledonia, with 75 baud RTTY RY's at 2216. (Hetherington-FL)
22664.0	FUM-French Navy Papeete, Tahiti, with 75 baud RTTY at 2144. (Hetherington-FL)

Bob Kay, *c/o MT, P.O. Box 98, Brasstown, N.C. 28902*

Holiday Scanning

The month of November typically begins our holiday travels. With the arrival of Thanksgiving, we will be visiting with family and friends. The problem, as we all know, is to find the time to visit with relatives and still take advantage of new scanning opportunities. With today's technology and a little ingenuity, it's possible to keep a busy holiday schedule and still not miss out on the scanning action. Here are a few hints and ideas on how.

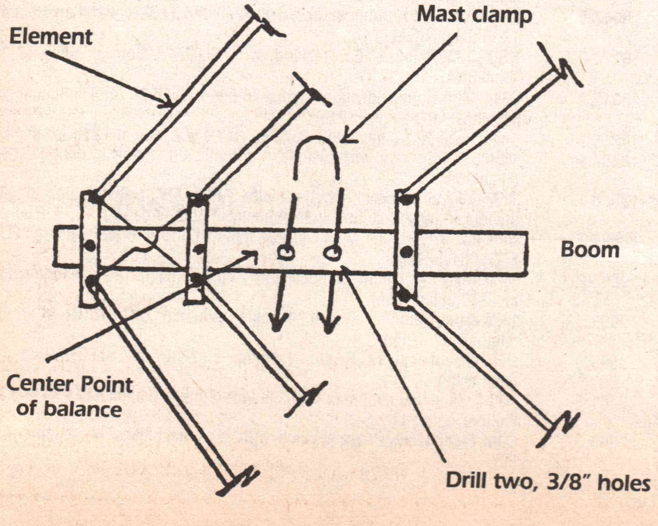




If you visit "Grandmom's" house on a routine basis, you may want to convince her to subscribe to cable television. After the cable is installed, you can get on her roof and change the old television antenna to a vertical position. All you'll need is a portable drill, a 3/8-inch drill bit, and a box wrench. Simply drill two new holes into the antenna boom and use the existing hardware (see sketch). Replace the twin lead with a balun and RG-6 cable and you've got a scanning antenna. For optimum results, the elements should be trimmed, but the antenna will work without further modification.

A length of wire can also be used as a scanning antenna. It can be tossed out a window or temporarily hoisted into a nearby tree. To get the antenna at maximum height, use a sling-shot to propel a string over the tree branches. Connect the wire antenna and coax to the string and pull the antenna into position. The inverted "V" antenna (see sketch), is the most popular long wire scanning antenna. It is fed slightly off center and will provide reasonable reception between 30 and 500 MHz.

The Grove "Hidden Antenna," (Cat#ANT-6), can be hung behind curtains or installed behind a door. Magnetic mount mobile antennas also make great portable antennas. The antenna can be temporarily attached to any inside metal surface. If your relatives object to any type of indoor or outside antenna, here's another solution. Whenever you are away from home, your vehicle can become a temporary listening post. Attach a length of coax cable to the mobile antenna on your car and temporarily run the cable to your indoor location.



Unattended mobile scanning can also be accomplished with battery-operated scanning accessories. A portable, voice-activated tape recorder, for example, can "babysit" your mobile scanning radio while you enjoy visiting with family and friends.

The "Scout" by Optoelectronics is another device that can be utilized for discreet scanning. As most of you know, the Scout will automatically tune the AR 8000 and AR 2700 scanner radios. Best of all, the Scout and AR scanner radio can be clipped to your belt and hidden under bulky winter clothing. With the addition of an ear piece, you can sit at the dinner table and catch all the scanning action. If anyone questions the wire going to your ear, tell them it's a hearing aid! For more information on the Scout, see the review in this month's "What's New?" or call Optoelectronics at (305) 771-2050.

Traveling by air? In addition to bringing along your scanner radio, don't forget the "Interceptors" by Opto Electronics. The Interceptor for FM signals (R-10), will capture any nearby FM transmission between 30 MHz and 2 GHz. The AM Interceptor (R-20), will capture any nearby AM transmission between 0.5 MHz and 3 GHz. Both units will instantly capture a radio transmission and will allow you to hear the action. Simply push either unit into your pocket and use an earpiece for private listening. The R-20 is especially useful for monitoring AM aircraft transmissions. And although the R-20 is safe to use while on board an airplane, don't forget to observe the airline regulations regarding the use of electronic devices.

Laptop computers and battery-operated scanning gear are rapidly becoming intertwined. With today's technology, a complete and powerful monitoring station can be carried into any location. From deep woods scanning to scanning from the top floor of a sky scraper, the possibilities are limitless.

If you'll be traveling during the holidays, there's no excuse for leaving your scanning gear at home. Who knows? You may discover new frequencies that will inspire you to make a return visit. Have fun and don't forget to send your holiday frequencies to the Scanning Report. Write to P.O. Box 98, Brasstown, NC 28902.

■ Treasure Hunt

For the month of November and December, we'll get into the holiday spirit by offering everyone a free frequency list that includes the frequencies for bumper beepers, wireless microphones, itinerant frequencies, and a few of the more popular fast food frequencies.

1. Provide an itinerant frequency.
2. What does the acronym APCO stand for?
3. What is the frequency for Marine channel #1?

4. A computer virus can be spread by airborne dust particles. True or False?
5. In the 806 to 894 MHz band, the higher frequency is the base frequency and the lower frequency is for mobiles. True or False?

Frequency Exchange

Did summer pass by too quickly? If so, why not join the snowbirds at the shore? Chip Veres lives in **Hollywood, Florida**, and here are Chip's favorite frequencies.

30.70	Gas Delivery Company
35.02	McDonalds at 58 & Holly
39.10	Wildlife Officers
44.80	Marine Patrol
45.24	State Prison
45.46	Highway Patrol
45.84	Palm Beach Hwy. Dept.
119.300	Miami Approach
120.200	Lauderdale Approach
130.050	Bahama Commuter Co.
150.905	Parking enforcement
154.74	Broward Police
154.755	Sheriff
160.53	CSX railroad
450.65	Traffic Control Report.
451.25	Power & Light
451.9875	American Cab Co.
453.025	Broward General Hosp.
453.20	Dade Co. radio repair
462.40	Yellow Cab Co.

If you're enjoying the warm Florida sunshine, our next stop promises to be just as enjoyable. Here is an anonymous list for **St. Mary's, Georgia.**

43.28	Logging company
48.54	Gas & Light
151.775	Cable TV company
151.9375	UPS
153.08	Anheuser Busch
159.495	Brinks Armored
160.56	St. Mary's Railroad
160.62	St. Mary's Railroad
461.30	Alamo rent-a-car
463.675	Kings Bay Taxi
464.825	BF Goodrich Co.
464.8375	UPS

You'll need a light jacket for our next stop. Since the invitation arrived anonymously, we'll need to stand outside in the cool air that surrounds Dover Air Force Base in **Dover, Delaware.**

123.000	Traffic advisory
138.045	Maintenance
172.30	Security
173.175	Crash/fire
173.5625	Base Hospital
173.8625	Crash/fire
225.400	Ground Control
327.500	Tower
349.400	Command Post
353.300	Approach
359.300	Bird watch
363.800	Approach
413.10	Commanders freq.

Since we're already in the state of Delaware, let's visit with Randy Bell. Randy lives near **New Castle County, Delaware**, and here are the frequencies that Randy enjoys.

Delaware State Police

154.665
154.695
154.755
154.86
154.935
155.46
155.475
155.85
465.275
465.35

Wilmington, Delaware, 800 trunked system

856.2625
856.7625
857.2625
857.7625
858.7625
859.7625
860.7625

Fasten your buttons and turn up your collar; our next stop is in **Pittsburgh, Pennsylvania.** Welcome to the home of Rich Newbould.

49.86	Pittsburgh Penguins
154.60	Baldwin/Whitehall sch.
454.10	Jefferson Center hospital
455.3125	WDVE Radio
464.55	Star Lake Amphitheater
466.8375	NY Rangers hockey
469.075	Star Lake Amphit. security

US Air trunked system at Pittsburgh International

854.7875
855.7875
856.7875
857.7875
858.7875

Now that you're accustomed to the colder climate, let's travel further north to **Mount Valley, New Hampshire.** Jonathan Webster has turned on his scanner radio and has invited everyone to listen to the following:

44.95	State Police
45.96	State Police
45.18	State Police Helo
45.26	State Police
151.325	Fish & Wildlife
151.34	Fish & Wildlife
151.385	State Parks
154.445	Conway Fire
154.86	Carroll County Sheriff
155.205	School Buses
155.535	Carroll County Sheriff
155.64	Conway Police
160.275	North Coast RR
161.25	Conway Scenic RR
171.525	Forest Service
453.925	Dept. of Transportation
453.975	Dept. of Transportation

Reach for a scarf and grab your ear muffs; our last stop is from an anonymous contributor in **Toronto, Canada.**

One District Police

857.4125
861.2375
861.6875
861.7375
862.2375
862.7375
862.9125
863.6875

Two District Police

861.4875
861.9875
862.4875
862.9875

Three District Police

862.1875
862.4375
863.2375

Hold-up and Surveillance Band

859.6625
860.2125
860.3125
860.4125
860.4375
860.4625
860.4875
860.6875
860.8125
860.9125
860.9875
863.6625

To see your name and frequencies in the pages of *MT*, send your favorite monitoring list to the Scanning Report, P.O. Box 98 Brasstown, NC 28902.

Scanning TV

Listening to your favorite television station with a scanner radio is something that most scanner buffs overlook. Don't forget to set your scanner radio to FM wide band.

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TV Audio Channel #	Frequency
3	65.75
4	71.75
5	81.75
6	87.75
7	179.75
8	185.75
9	191.75
10	197.75
11	203.75
12	209.75
13	215.75
14	475.75
15	481.75
16	487.75
17	493.75
18	499.75
19	505.75
20	511.75

For a free complete listing of the TV audio frequencies send a #10 SASE to the Scanning Report, P.O. Box 98, Brasstown, NC 28902

CB Radio

If you're a typical scanner buff, you have been ignoring the CB radio frequencies. To monitor the lively and "colorful" conversations on Citizens Band radio, check out the following frequencies in AM mode.

Channel	Frequency
1	26.965
2	26.975
3	26.985
4	27.005
5	27.015
6	27.025
7	27.035
8	27.055
9	27.065
10	27.075
11	27.085
12	27.105
13	27.115
14	27.125
15	27.135
16	27.155
17	27.165
18	27.175
19	27.185
20	27.205
21	27.215
22	27.225
23	27.255
24	27.235
25	27.245
26	27.265
27	27.275
28	27.285
29	27.295
30	27.305
31	27.315
32	27.325
33	27.335
34	27.345
35	27.355
36	27.365
37	27.375
38	27.385
39	27.395
40	27.405

Rules and Regs

One of the attractive things about the hobby of scanning is that it can be enjoyed from a variety of skill levels. Some folks are content with listening to their police and fire frequencies. Other folks are more curious and will spend hours manipulating their scanner radio and searching for additional elusive frequencies.

Regardless of your particular skill level, there's always room to improve or to expand your listening horizons. One of the ways to make the hobby more interesting is to learn a few of the rules that govern the radio spectrum.

Did you know for example, that in the UHF band 450 to 470 MHz, paired frequencies are spread 5 MHz apart? And did you also know that the lower of the two frequencies will be assigned to the base station or repeater? The rules become especially important if you're monitoring an agency that is using paired UHF frequencies. If you've got one frequency, the rules will help you to find its matching counterpart.

Here are a few additional rules that will help you to enjoy the hobby: In the 806 to 894 MHz band, the higher frequency is the base frequency and the lower frequency is for mobiles. The UHF-T frequencies (470-512 MHz) always have two frequencies that are spaced 3 MHz apart.

The rules and regulations that govern the radio spectrum can be used to your advantage. Serious scanner buffs keep them handy for quick reference.

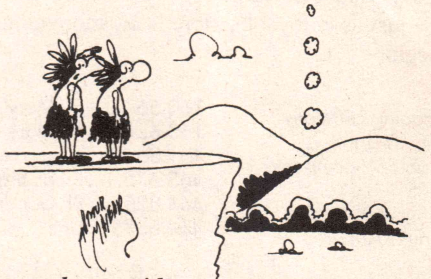
LOJAC

LOJAC is an anti-theft device that helps the police to find a stolen vehicle. The unit transmits a brief radio signal 5 times per minute that can be monitored by the local police. The frequency to monitor (no voice will be heard), is 173.075 MHz.

Commercial Air

The commercial airlines send business messages via two way radio between 128.900 and 132.000 MHz. These messages may travel as far as 100 miles or more. If you're near an airport or in the flight path of commercial airplanes, place your scanner radio in AM mode and search between the listed frequencies.

Speaking of holidays—remember, a twelve month subscription to *MT* makes a great Christmas gift!



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BEGINNER'S CORNER

Uncle Skip's Guide to Monitoring

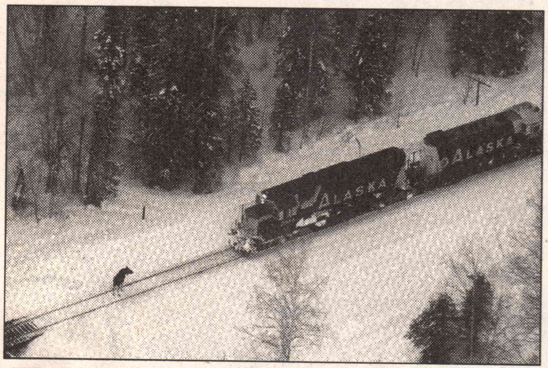
Skip Arey, WB2GHA
TJAREY@AOL.COM

My Alaskan Adventure

They say that travel broadens the mind. It can also teach an old dog a few new tricks and put even Uncle Skip back into the beginner's position. It all started when my spouse announced "We are going to Alaska!" The tone of her voice indicated that the tickets had already been bought.

My wife and kids had been to Alaska before to visit relatives, but this was the first opportunity for this East Coast boy to take the trip. My world view and appreciation for some scanning activities were about to be changed dramatically.

Early on in the planning, it became fairly clear that the many activities available and things to see would limit my time at the radios. (Remember, there is nothing wrong with this. Taking a vacation, even from your normal hobbies can be very relaxing.) Still, I wanted to see how the radio hobby faired in our northernmost state.



"Having a great time," read Skip's postcard to the office.

I settled on packing a Radio Shack Pro-43 handheld scanner and an aging Kenwood TH-21AT 2-meter handheld transceiver. Both these rigs barely took up space in my carry-on flight bag.

Just a word here to neophyte travelers — you may be asked to explain your hardware as you go through boarding security. A call to your airline will explain any restrictions you may need to deal with. For instance, a call to the United Airlines 800 service number revealed that I could be expected to remove the batteries from the transceiver and I would be asked to not make use of the scanner during the flights.

Preparation for my vacation radio activities couldn't have been simpler. A quick scan of my Grove and Percon CD ROMs gave me a bunch of public safety and commercial frequencies for the area surrounding Homer, Alaska—the place we would be staying. A brief glance at the American Radio Relay League *Repeater Directory* told me I would find amateur activity on 146.910. After about twenty minutes of memory programming, I was ready to conquer the Alaskan radio waves.

Or so I thought. I was about to discover that my assumptions about radio activity did not apply in the world around the 59th parallel.

My first awakening came before we even arrived in Alaska. Our connections gave us a two-hour layover in Chicago's gigantic O'Hare Airport. My long-suffering spouse had her latest Dean Koontz novel to occupy her time. My Number One and Number Two Sons were glued to their Nintendo Gameboys. I was left sitting there wondering how to occupy two hours.

Hmmm, I've never been very interested in monitoring the aircraft frequencies. Still, two hours is a long time. I decided to give it a shot anyway. I set the Pro-43 to examine 118 MHz through 140 MHz. I knew off the top of my head that a lot of civilian air frequencies were in that range somewhere. The scanner came alive with signals, and the two-hour layover flew by.

I had occasionally monitored my local international airport in nearby Philadelphia, PA, and was never really impressed with the signals I heard. But here I was in one of the busiest airports in the world during a period of heavy business and vacation travel. This was more fun then a DX pileup on 20 meters!

I remain amazed that they can get all those planes in and out of Chicago. Listening in on the action gave me a new respect for the folks who keep 'em flying. I also came to realize that maybe I hadn't given enough thought to monitoring the aero bands back home. I know I'm going to spend a lot more time reading Jean Baker's "Plane Talk" column in the future. Lacking a specific frequency list, I had to make some not-so-educated guesses as to what I was hearing.

Pretty soon, I had figured out some of the tower, approach, and departure frequencies. I was even able to hear my soon to be out-going flight arriving at the airport. It has been a long while since I spent such an enjoyable couple of hours at my scanner. I was doing something new to me and I was learning something. What more can a person ask for?

Never let anyone try to tell you that being a beginner isn't a lot of fun. I repeated this scanning experience in my shorter layovers in Seattle and Anchorage airports. If you do a lot of air traveling and spend many boring hours waiting between flights, you might be able to consider a scanner purchase as a business expense under the line item of "Stress Management"!

Do as the Alaskans do

But even bigger surprises were on the way for your intrepid, globe-trotting radio sage. Once we landed in Homer and got settled in at my in-laws, I figured I would turn the scanner on and have the usual public safety fare to listen to. Hmmm, again! I started to think that something was wrong with my rig. I listened for an hour and only heard the periodic mandatory ID signatures of a few communications systems. What did people do for excitement in Alaska?

My brother-in-law clued me in to where the action really was. He told me to give a listen to the VHF maritime frequencies. If you look on a map of Alaska you will find Homer a little more than 100 air miles South of Anchorage on the Kenai Peninsula. It is a seacoast town with commercial and recreational fishing as its main industries. Given some thought, it makes sense that you would hear quite a bit on the maritime frequencies in a town where there are more boats than cars.

A quick glance through my brother-in-law's copy of Chapman's *Piloting* reacquainted me with the likely frequencies. Like the aero frequencies, I had never paid much attention to the boat channels, beyond hearing the occasional bridge-to-bridge communication on the Delaware River. Now I was in a part of the world where people used their VHF boat radios more than they used their telephones.

The simplex frequencies dedicated to calling, intership, bridge to bridge and port operations were alive day and night. I learned what life on the water was like for folks who made their living catching salmon, halibut, and crabs. Also, many of the recreational areas and tourist activities required a boat trip. Homer had dozens of water taxis taking people to various places around the Kachemak Bay and Halibut Cove. All of these things made for very active scanning—all on frequencies that I had little regular experience with.

Monitoring local Coast Guard activities also turned up a lot of activity, including listening in on the coming and goings of the Coast Guard Cutter *Roanoke Island* (WPB-1346). One bit of excitement I turned up was a small boat that had lost power in the Cook Inlet. For some reason the boat operator was unable to give an accurate position to the Coast Guard, so they made use of radio direction finding (RDF) equipment to locate the vessel in trouble and tow it safely into harbor.

■ Other stuff

On the amateur radio side of things, a few conversations on the .91 machine brought about a couple of "eyeball" contacts with local hams. Here I learned the hams in Alaska are pretty much the same as everywhere else in the world. They like to talk about their equipment, brag about their accomplishments, and complain about the lack of public interest in their efforts until an emergency hits.

The part of Alaska I was visiting is surrounded by several historically active volcanoes. The area is also subject to earthquakes. In such an environment, having a few hams in the neighborhood is probably more important to the community than most folks realize. In the early sixties, Alaska experienced a serious earthquake that knocked out all communications except—you guessed it—amateur radio. Is it any wonder that Alaskan hams tend to take their emergency preparedness very seriously?

One day, while hanging around the docks, I saw several C-130 aircraft painted olive drab, practicing "touch and go" landings at the local airport. Suppressing pangs of homesickness for the Army, I quickly punched the buttons on my scanner that brought me the military aircraft frequencies in the 225 through 400 MHz range. Hearing that good, old-fashioned military lingo made me take out my ever-present camouflage hankie and wipe away a tear or two.

■ The moral is ...

So what is the point of this little radio travelogue? Basically, I spent over two weeks monitoring frequencies I wouldn't have even plugged into my scanner back home, and I enjoyed every minute of it. Even a beginner can become locked into too narrow a focus. It is easy to become so wrapped up in monitoring your local public safety activities that you miss the fact that your scanning receiver probably covers 70% more bandwidth than most people ever take the time to listen to.

The wake-up call Old Uncle Skip got from this trip was to take some more time checking out all those "other" frequencies, especially when traveling. Just because they have low activity in one part of the country doesn't mean they aren't jumping with stuff somewhere else.

Okay let's review what we have learned.

1) Pack light and pack smart. You're going on vacation. Take only those radios and accessories that will give you a little diversion from all the fun you are having or to play with on days when the weather doesn't cooperate with your other activities. Remember we are forced to live in a world where we have to have our luggage searched and almost any electronic device is subject to scrutiny.

2) Do your research before you leave. Pay attention to getting as much information as you can from your resources that will help you make logical decisions about what your radio activities will be. Don't ignore the obvious. I should have figured there would be a lot of maritime activity in a town built next to the water—Look at a map, not just a frequency list.

3) If you can make some contacts with radio monitoring folks in the area before you arrive, it will help you get a notion of what's worth listening to. Amateur radio operators have an advantage in this area, thanks to packet radio, especially. If you can't make the contacts beforehand, try to locate radio oriented people when you hit the ground.

4) Assume nothing based upon your previous radio experiences. It is a big world and things are often different than you expect them to be. Get flexible and work with what you find. You should be able to experience interesting monitoring anywhere on the planet if you just broaden your horizons a bit.

5) Relax and have fun. Traveling can be a big pain, but a little relaxing radio monitoring can reduce the stress if you remember not to take it all too seriously.

TABLE 1

Simplex VHF Maritime Frequencies

Chan	Shore	Usage
1A	156.05	Port operations/Ship to ship
5A	156.25	Port operations
6	156.30	Ship to ship/Safety (mandatory)
7A	156.35	Commercial ship-ship, ship-shore
8	156.40	Commercial ship-ship
9	156.45	General ship-ship, ship-shore
10	156.50	Commercial ship-ship, ship-shore
11	156.55	Commercial ship-ship, ship-shore
12	156.60	Port operations
13	156.55	Bridge to bridge navigation
14	156.70	Port operations
15	156.75	Weather (receive only)
16	156.80	Distress/Safety/Calling (mandatory)
17	156.85	Government control
18A	156.90	Commercial ship-ship, ship-shore
19A	156.95	Commercial ship-ship, coast-coast
21A	157.05	Government use
22A	157.10	US Coast Guard Liaison
23A	157.15	Government use
65A	156.275	Port operations
66A	156.325	Port operations
67	156.375	Commercial ship-ship
68	156.425	Non-commercial ship-ship, ship-shore
69	156.425	Non-commercial ship-ship, ship-shore
70	156.525	Non-commercial ship-ship
71	156.575	Non-commercial ship-ship, ship-shore
72	156.625	Non-commercial ship-ship
73	156.675	Port operations
74	156.725	Port operations
77	156.875	Port operations
78A	156.925	Non-commercial ship-ship, ship-shore
79A	156.975	Commercial ship-ship, ship-shore
80A	157.025	Commercial ship-ship, ship-shore
81A	157.075	Government use
82A	157.125	Government use
83A	157.175	Government use

SHORTWAVE BROADCASTING

The Global Forum

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Blown Away

Hurricane Luís blew the BBC/Deutsche Welle Caribbean Relay in Antigua off the air for at least a fortnight in September. BBC quickly substituted UKoGBaNI transmitters on 11865 in the morning, 5975 evenings, and 9640 late-nights, but in deep North American reception was poor to useless, with super-splatter WEWN dominating from 11875, the Colombian heterodyne on 5975; in effect, BBC was inaudible after the Canada relay on 6175 closed at 0330. Long BBC's loudest and clearest channel in central North America at 0030-0230 — 9590 via Delano — does not even appear in schedules, as it's intended for south of the border. At first, 11865 matched 12095 from UK, but soon it acquired a satellite-delay to become synchronized with Canada 9515 and after 1500, 11775—so if not Antigua, whence? BBC was tight-lipped, but admitted two weeks later that Luís had "eaten the Antigua antennae" requiring some substitute sites, per *Write On*.

The Caribbean lacks any English-language shortwave, but BBC's *Caribbean Report* serves the purpose, weekdays 2115-2130 on 17715 via Delano, 15390 via Ascension, and 5975 via Antigua; morning editions were to be added weekdays at 1105 and 1210, presumably on 6195 and 930. (By the way, 15390 warming up from 2110 is a good chance to hear "Bow Bells," from a 1926 recording.) VOA's Caribbean service also covered the disaster, Tue-Sat 0010-0030 on 6130, 9455, 11695. However, one UT Sat at 0010 VOA replaced this with *Newsline* // the other frequencies (*World of Radio*)

BURUNDI Radio Burundi's erratic outlet only on 6140 from Gitega seems to be a composite of two FM services, Channel 1 in Kirundi, and Channel 2 in French, Swahili, English, at 0300-0700, 0900 (Sun 0700)-2100, including news in English daily at 0345, 1130, 1500, 1745; fax them at +257-22-6547 (BBC Monitoring)

CAMBODIA National V. of Cambodia domestic service on 6090 has 15 kW, 4907 has 50 kW, and extended to 2230-0700 & 1100-1500; new address: 105 Preah Kussamak St., Phnom Penh (Andy Sennitt, *WRTH* via RN*MN*)

CANADA An RCI newscast says CBC has formally absorbed RCI. CBC President Perrin Beatty promised RCI will continue until end of fiscal year next March, but its future beyond that unknown. Powers that be have been dangling RCI by a thread over the abyss of oblivion for five years. Will they snip this thread? Stay tuned to RCI—it's like a soap opera! (Bob Thomas, CT, *W.O.R.*) RCI *Mailbag* fax: 514-284-0891 (André Courey) RCI refuses to broadcast the CBC series *Ideas*, but transcripts of a great many programs are available, generally C$7-25 depending on length; ask for a catalog from CBC RadioWorks, 1-800-363-1530 (via Bruce Atchsion, Alta.)

COSTA RICA RFPI tried 9390-USB 24 hours to escape interference on 9400, then went back to 9400; planned to run 30 kW transmitter daytimes on 15050 in addition to nights on 7385. Hawaii is a possible future site for an RFPI clone (RFPI *Mailbags*) Between 0200 and 0300, 9390 marred by spurs from Spain mixing 9540 and 9690 China relay, also on 9840 (Brian Alexander, PA) Israel's Hebrew service also long hours on 9390, a problem in eastern NAm, ex-9388 (Kevin Hecht, Alexander) But Italy 9645 puts spurs on 9398.77 and 9891.23 from 0005 including English 0050 (Alexander). And Pakistan sked on 9400 1645-2030 (via Gigi Lytle) May try 9900-10000 range next, resuming rotatable long-periodic. Some 4th-quarter program changes: *RFPI Reports*, news of Central America, daily 2230. *Far Right Radio Review*, besides Tue 1800, Sun 2200 and +8, +16 hour repeats, gets Sat 2000. If foundation funding comes through, plan to expand it to 5 nights a week live with guests, call-ins, perhaps renamed *Global Community Forum* (RFPI *Fiesta*)

R. Casino, Limón, 5953.64 is easy around 1200-1300 in Spanish with VOA news relay until 1215, then "76 Trombones" and its own *Radio Noticias* (Rich McVicar, Ecuador, HCJB *DXPL*)

CYBERSPACE *World of Radio* via World Radio Network is now available as a RealAudio file, at **http://www.wrn.com/** (Pat Durkin, MN) The actual digital file was called **gh1.ra** (Peter Costello, NJ) Took 12 minutes to download the 29-minute program with a 28,800 bps modem, then listened to it on my PC (Rob Peacock, Ont.) A little garbled but much better than SW recently. To get RealAudio for Windows/Mac: **http://www.realaudio.com**. To hear *W.O.R.* with RealAudio properly installed: **http://town.hall.org/radio/Mirrors/WRN/ghl.ram**. To download *W.O.R.* for later listening, end it with **gh.ra** (Joel Rubin, CA)

CZECH REPUBLIC R. Prague's *Calling All Listeners* hosts have decided to get revenge on the Czech government, saying how the government has ruined this and that. It's one of the best programs on the dial—a complete opposite of Pyongyang. Hosts are a bit unhappy about the imminent demise of R. Prague, which they mention regularly (Daniel Atkinson, England, *DX Listening Digest*) That's on the Monday morning, Wednesday evening broadcasts (via Kevin Hecht, *DXLD*)

ECUADOR **Emisoras Gran Colombia** was about to reactivate on 4960 ex-4911, then delayed for quite some time (*PWBR* via *NU* via HCJB *TLC*) **R. Quito** here very strong on 9837.9 = 2 x 4918.9 (Rich McVicar, Quito, *TLC*) HCJB picked 6050 for Europe at 0700-0830; 21455-USB kept on the air after all, but 15540 cancelled as of Sept 24, as it moves to two-season frequency scheduling (*DXPL*) *Travel Latin America* is the Friday feature on *Studio 9*, at 0730, 0900, 1700, Sat 0100, 0500; on the third Friday, *Latin American Travel Advisor* (via *DX Ontario*)

EQUATORIAL GUINEA Panamerican Broadcasting, American religion in English, has an additional Radio Africa service, No. 2, Mon-Fri 0700-1100 on 50 kW 15190, as well as eves 1650-2300 on 7190, and R. East Africa Sat/Sun 0700-1600 on 15190. Transmitters are leased from R. Nacional, where the engineer says there is also a 1 kW standby, explaining why Bata is sometimes heard on both 5005 and alternate 4926, both listed at 50 kW, and why R. Africa sometimes on both 7190 and 15190 (Andy Sennitt, *WRTH* via RN*MN*)

ETHIOPIA V. of Peace/R Amahoro, heard on 9560.2v at *0428-0530* announcing it is on Sat and Sun only; xylophone IS, opens and closes in English (Brian Alexander, PA, *W.O.R.*)

FINLAND YLE Radio Finland W-95 English to NAm: 1230-1300 & 1330-1400 on 15400, 11735; 1630-1700 on 13645, 11785 (via Edward H. Hamill, CA) Earlier version showed 1630 on 9680, 11755 (Wolfgang Büschel, WDXC)

GUAM After several-year break, KTWR resumes *Pacific DX Report* Sept. 30, including input from ARDXC, Sats 0815 on 15200, 0940 on 11830, Mons 1615 on 11580 (Bob Padula, HCJB *TLC*)

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; W-95 = Winter season

IRAQ Mother of Battles Radio, mentioned last month on p. 47, was inaugurated on the Aug 2 anniversary of Kuwait invasion; confirmed at 2000-2300 only on 7150v, not the higher channels, and this also carries other external services, ex-17740, including 0500-0600 Persian, 1600-1700 Arabic/Tigringna V. of Eritrea, overlapping irregularly with 1600-1800 Persian, 1700-1800 Arabic/Somali, 1800-2000 Turkish; one day it was on 7151.4, the next on 7146.9. Reactivated in Arabic until 2240* was 11875. Main domestic service in Arabic irregularly on 4615, Kurdish on 6565. English, French, German, Russian, Spanish no longer heard (BBCM)

[non] V. of the Iraqi People (Arabic: *Idha'at Sawt al-Sha'b al-Iraqi; Sorani Kurdish*: *Ere deng-y gel-y Iraqe*), "the voice of democracy and progress, the radio of the Iraqi Communist Party," in Arabic at 0400-0500, 1830-1930 as presumably timeshifted for winter, on 7025v, 5830v, 3910v; may be connected with V. of Iraqi Kurdistan (BBCM)

IRELAND [non] Ireland Overseas Broadcasting, Ltd., experimented with a special via BBC UK transmitters, Sunday, Sept. 3 at 1400-1600 on 9605, 5875, 250 kW each, for hurling championship coverage, and again two weeks later for football finals; reports to Box 4950, Dublin 1 (R. Netherlands *Media Network*) 9605 heard from 1400 with flute music, multi-lingual IDs, 1425 hurling until 1500 fade (Ed Rausch, NJ, HCJB *TLC*) 5895 was from Woofferton, 9605 from Skelton (Dave Kenny, BBCM, *Jihad DX* via HCJB *TLC*)

ITALY In connection with an AWR contest, the 10kW Forlì transmitter running at 2.5 on 7230 will beam about 280° toward USA two nights during darkness, Nov. 18 and 19, tentatively (Adrian Peterson, AWR)

IRRS 7125 transmitter was off in August after lightning hit, but besides fixing it planned to have second SW transmitter on by beginning of winter season (A. Cotroneo, IRRS, *Jihad DX* via *DXPL*)

JAPAN [non] R. Japan Canada relay on 5960 makes usual switch Oct 29 of English to 0300 instead of 0100; plans to drop Gabon relay at yearend for Europe, still for ME/Af (Kevin Hecht, PA) Direct from Japan at 0100, 0300, 0500 on 9605 ex 11790 (R. Japan *Media Roundup*)

KASHMIR V. of Independent Kashmir no longer heard on 5000, 4080 or any previous frequency (Victor Goonetilleke, Sri Lanka, *Wavescan* via BBCM) We refer to it as V. of Kashmir Freedom (Urdu: *Sada-i Hurriyat-i Kashmir*), heard last February at 0230-0300 & 1430-1530 on 5300, 5750, 6300 (BBCM)

KUWAIT The Thursday 1800-2100 FM relay in English on R. Kuwait, 11990, is a dedication program with phone-ins called "Mex" or something like that (Daniel Atkinson, UK, *DXLD*)

MEXICO R. México Int'l, 5984.7 heard from 0327 talk, 0330 ranchera music, 0400-0456* *La Hora Nacional* UT Mon, off with anthem, again with news from *1300 (Dave Valko & Hans Johnson, CO)

Radio Huayacocotla, México, found the new director of the Secretariat of Communication & Transport more friendly than his predecessor, as he authorized the station to resume broadcasting in July on 2380 kHz (DEVMEDIA via AMARC via Don Moore, who assumes they meant to say 2390, although it has not been confirmed, as reported in *Fine Tuning*.)

Gigi Lytle and Winnie Almeida.

MONACO Britain apparently goes off DST a week before we do, since TWR schedule shows time change Oct 22 for English to: 0740-0920 (Sat 0905), Sun 1230-1255 & Sat 1230-1300 on 7110. Slick multilingual sked does not specify which broadcasts are via Albania (via Gigi Lytle)

MOZAMBIQUE [non] R. Maputo has English daily at 1100-1135 & 1800-1900 on MW 918, but not heard on announced SW 11835 & 11820 at 1100, 4855 & 3265 at 1800. Fax: +258-1-421816 (BBCM) R. Portugal news reports a cooperation agreement with R. Mozambique for its newscasts to be broadcast on RDP's international service (BBCM via HCJB *TLC*)

NETHERLANDS [& non] On only a few weeks' notice, R. Netherlands announced that its 67-year-old program *Happy Station* would be cancelled after Sept. 17 (Steven Cline, IN) Replaced by *Siren Song*, with Miss Dheera Sujan and guests telling stories of their life experiences (Diane Mauer, WI) However, *La Estación de la Alegría* in Spanish continues on alternate Sunday broadcasts. Full Spanish SW sked for W-95: 1130-1155 & 1200-1225 on Bonaire 9715 & 6020; 2230-0125 on B-15315 joined by: 2230-2325 B-11730 & Flevo-6020; 2330-2425 on B?-6190; 0030-0125 on Madagascar for first time, 9895; 0230-0425 on B-6165 & 6020 (*Radio-Enlace*)

Dheera Sujan of Radio Netherlands

NEW ZEALAND *Sounds Historical* is interesting two-hour weekly history of NZ on RNZI, Sundays at 0800 on 6100 (Chet Copeland, DC) Now on 9700, maybe one hour earlier

PERU R. Altura, 7559.76 to 0235*, next night on 7559.36v at 0107, folk music, 0258 ID and abruptly off by when it was 7559.66 (Brian Alexander, PA, *W.O.R.*)

R. San Ignacio, 4183.07, "la Super Radio" at 1231 announcing "4200" so previous log on 8364.77 was second harmonic. A different **R. San Ignacio** is on 6747. New on 5547.38v is **R. Paccha**, at 1215 and 2345, at Jirón Ramón Castillo 52(?), Paccha, Chota province, Cajamarca department. Subsequently measured on 5277.01. New on 5498.12 is **R. Lajas**, 0232-0355* as "5500," address Jirón Recinto Manuel 589, Lajas, Chota, Cajamarca; back next night at 0000. **R. Imperial** on 6420.28 at 2018 with Ecuadorian music, presumably ex-6544 from Huancabamba. **R. Cosmos**, 4627.25, heard UT Sun 0322-0632+, dedications, very poor mike audio, at Jirón San Martín 474, presumably Celendín, Celendín, Cajamarca (Rich McVicar, Quito, Ecuador, HCJB *DXPL & TLC*) New on 4750.1 is **R. San Francisco Solano**, La Voz de la Parroquia de San Miguel de Sondor Y Sondorillo, which is at Calle San Miguel 215, Sondor, Huancabamba province, Piura dept (Henrik Klemetz, Colombia, HCJB *TLC*)

PORTUGAL Winnie Almeida told me when I visited RDP that only two complaints about the clash with BBC on 6175 had been received; needed four to take any action (Gigi Lytle via Diane Mauer) Is it really the listener's responsibility to point out the painfully obvious to professional radio engineers who should know better? (Randy Stewart, MO, *W.O.R.*) see also MOZAMBIQUE

ROMANIA RRI English service has renovated offices with new desks and carpeting; and a new engineer trying new frequencies; reports wanted. Frederica says people should not just bitch to DX programs about frequency conflicts, but write directly to

DX Listening Digest

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the station so a plea for adjustments can be made to engineers (Gigi Lytle, TX) When I visited RRI the decorators were causing chaos. State subsidies are a shoestring. Had run out of tapes and had to use bad old ones over and over (Michael Osborn, BDXC *Communication*)

RUSSIA Two *WRTH* collaborators visited the Samara SW site, once in the countryside, but now surrounded in the northern part of the city. There are at least 18 transmitters here including those previously identified as Zhigulyovsk and Kazan. There is also an ex-jammer in central Samara designated "7" from which Radio 7 now uses 4 x 2.5 kW on 6130, plus big site on 9550. Remember that large SW sites were also used for skywave jamming. Lesnoy has around 30 curtains, ranging from 4x4 to 8x12 elements; AWR says Novosibirsk has 100 curtains, Krasnodar 60, half of which are 4x4, the others 4x8 or 8x8 (Olle Alm, Sweden, *DXers Calling* via *NZ DX Times*) The Bengali program at 1330-1400 on 15470, *Mukto Probaho* was expected to move to 7400 for W-95; and it's a *Christian* program aimed at Moslems in Bangladesh (Ashok --, Calcutta, WWDXC via Büschel, HCJB *DXPL*) Strange BBCM didn't notice this angle. Got a reply from Mr. S. K. Abdullah, but not giving station name or transmitter site. *Mukto Probaho* is just the name of their Wednesday letterbox program, here translated as "Free Asking." The Friday show, "Word of God Fellowship" is obviously Christian (Herbert Meixner, *WWH* via Büschel, BDXC)

SOMALIA **R. Mogadishu, V. of Somali Pacification**, confirmed as separate from two other stations near same frequency. On 6722 at 0300-0500, 0930-1200, 1500-1800 with news at 0330, 1130, 1630, 1745; all transmissions open and close with Koran; reports on United Somali Congress-Somali National Alliance. (Somali: *Radiyo Moqdisho, Odka Nabadeynta Soomaaliyeed*). The other R. Mogadishus are: **V. of the Somali Republic**, supporting Ali Mahdi Muhammad around 6810-6832 kHz; and **V. of the Masses of the Somali Republic**, pro-Aydid around 6800-6870 (BBCM)

SOUTH AFRICA International media tycoon Rupert Murdoch is understood to have offered to buy SABC for two gigarand, but it was not for sale, and large foreign shareholdings are not allowed (*Sunday Times*, RSA via BBCM)

SUDAN [& non] **V. of Sudan**, V. of the National Democratic Alliance (Arabic: *Sawt al-Sudan, Sawt al-Tajammu al-Watani al-Dimuqrati*) in Arabic at 1300-1500 on one occasion slipped to 9018 avoiding Omdurman blockage on 9025, but then back to 9025 (BBCM) I enjoy the Sudanese rhythms and news on **R. Omdurman**'s English at 1800-1900 which seemed to have settled on 9200; *Frequency Guide*, Tuesdays around 1820 is a mailbag, not a DX program (Edwin Southwell, England) Arabic at *0300 on 7200 has a nice interval signal, so loud and clear they could do a prime-time external service to us better than Egypt, Iran (Randy Stewart, MO)

SURINAME R. Apintie back on 4990.97 in late August, 0933 poor but easy copy before Perú came on (Chuck Bolland, FL) 4990.95, presumed at 2330 in Dutch, no ID, India carrier interfered from 2336; also at *0726 and 0402* with anthem (Jerry Berg, MA, *NU* via HCJB *TLC*) 4990.9 at 0415 with gospel music, IDs after every song, dramatically improved signal (Ed Rausch, NJ, *W.O.R.*)

SWEDEN for W-95, R. Sweden to us "still" at 1330 and 1430 on 11650, 15240, tho 1430 really replaces 1230; 0230 & 0330 7120, LAm 0030 in English on 6065, 9850 (*SCDX/MS*)

SWITZERLAND SRI W-95 shows Brazil relay, which kept hopping 5885/5888, deleted, so NAm 0100 and 0400 both on 6135, 9885, and via Guiana 9905, with 9905 only extended on 0500. European service on new 7410 0500-0800, 7510 1700-1845.

Red Cross W-95 returns with new sked of 5-minute casts 4-weekly, not monthly, on Fris starting 29 Sept, repeated following two days, for English to other targets; Spanish to NAm UT Sats/Suns/Mons such as 18-19-20 Nov at 0315 and 0530 on same freqs (PTT)

TURKEY VOT says one of new transmitters will use SSB; wants faxes from listeners who can receive SSB to 412 490 9845 or 9846 (Arthur Ward, World DX Club *Contact*)

UKOGBANI For W-95, BBC via Canada times shift to: 1100-1400 5965, 1100-1600 (Sat 1715) 9515, 1400-1600 15260 (Bill Westenhaver via Joe Hanlon) Now that it has five different program streams, BBC WS planned to make time changes Oct. 1 for most except the American stream Oct. 29 to coincide with end of DST—so for first time, a one-hour-later-by-GMT across the board shift should occur, but also some permanent time changes to satisfy SW listeners better. (Tough luck for listeners in Latin America where there is no DST shift, or it occurs on different dates, in opposite direction, adding up to a two-hour shift by local clock.) For better SW coverage of S. America, time may be hired on other stations from March.

BBC WS faces a 5 megapound cut next year, so French to Europe will be dropped, as well as Radio International—the program tape service to radio stations, and there will be fewer special program productions (*Write On*) One day we found European-stream programming on Canadian relay 11775 for at least an hour before they fixed it. See also lead item.

USA The FCC has granted WWCR a construction permit for two more transmitters and three more antennas. Target date for WWCR-4 is about Dec. 15, depending on weather. Also gave test authorization for WWCR-1 on 3315 kHz, planned to replace 7435 for winter nights (George McClintock, WWCR) Ridiculous! (David Clark, *DX Ontario*, hard-core DXer) There was so much red tape to get this frequency cleared, don't expect 90m to fill up with other US SW stations quickly, just as 5065 has not been joined by others either (gh) Once active on 3315, WWCR will see about activating a channel on the 2.4 MHz band (McClintock)

From Oct. 29, WWCR programs shift one UT hour later to stay at same local time, and most frequency changes move one hour later so: WWCR-1, 1100-2200 on 15685, 2200-0100 on 9475, 0100-1100 on 7435 (or 3315); WWCR-2, Dr. Scott, 1400-0100 on 13845, 0100-1400 on 5935; WWCR-3, 1500-2300 on 12160, 2300-1200 on 5065, 1200-1500 on 7435. No. 3 schedule valid through January, but others change again Dec 1: No. 1, 1100-2100 on 15685, 2100-2400 on 9475, 0000-1100 on 7435; No. 2, 1400-2400 on 13845, 0000-1400 on 5935 (Adam Lock, WWCR)

World of Radio on WWCR, with expected winter timeshifts: Friday 2215 on 9475, Saturday 1400 on 15685, Sunday 0330 and 0700 on 7435, 1030 on 5065, Tuesday 1330 on 15685. *W.O.R.* retimed on companion WNQM AM 1300 to Sat 2:55 a.m. Central. See also CYBERSPACE

Brother Stair says he can lease a US SW transmitter fulltime if he can raise $1 million quick, but which? (Diane Mauer) Another time heard him naming WGTG as a station he was raising money to get on (gh) A powerful SW station soon to engulf the whole world would cost us $60,000 a month for 24 hours a day (*The Overcomer*)

VOA's *Communications World* got a new host, Dr. Kim Elliott, after Gene Reich left VOA to take a job with DBS radio entrepreneurs World Space, Inc. *CW* is on some, but not all VOA frequencies, Sat 1030, 1230, 1730, 2130, 2430 (gh) Unless declared "essential," VOA could be shut down temporarily Oct. 1 in government "trainwreck." A cut of $40 to $55 million is expected in all USG international broadcasting in 1996 (Elliott, VOA *CW*) A new Thursday-only Spanish broadcast from VOA is on W-95 schedule at 2300-2400 on 9670, 11930, 11960, 15115, 15365 (Kevin Hecht, PA) See also lead item.

VANUATU R. Vanuatu schedule revised to 1900-2100 on 3945, 2100-0600 on 4960, 0600-1115 on 3945; in December will resume 7260 for midday (Arthur Cushen, NZ, RN*MN*)

YEMEN Sana'a, Rep. of Yemen R., in English at *1759-1900 on 9779.77 starting with news, then US pop music, QRM from Portugal; but clear at *0301 in Arabic, not //7190 (Brian Alexander, PA)

ZAIRE Voix du Zaïre, reactivated on 15244 around +0600-1900+ with news in French at 1130, 1200, 1300, 1400, 1500, 1800 (BBCM)

Until the Next, Best of DX and 73 de Glenn!

Broadcast Loggings

Gayle Van Horn

0003 UTC on 4779.75
GUATEMALA: Radio Coatan. Spanish. Regional ads with phone numbers. Local time check to Latin accordian music. Signal strength S7-8. (Frank Hillton, Charleston, SC)

0032 UTC on 15115
NEW ZEALAND: Radio New Zealand Intl. News and sports to extended pacific weather forecast. National and international finance update. Time tips to 0100 ID. (Larry R. Zamora, Alamogordo, NM) RZI heard on 6100 at 0950 with *Celebrations of Sacred Music* program. (Bob Fraser, Cohasset, MA; John Bellovich, Macclenny, FL)

0037 UTC on 7108.06
BOSNIA HERCEGOVINA: Radio Bosnia Hercegovina. Unknown language from DJ format. Constant interference from amateur operators on frequency. Rock music from Bonnie Raitt. with DJ's musical intros. National news and ID, faded out by 0055. (David R. Vincent, Omaha, NE)

0100 UTC on 5895
CROATIA: Croatian Radio. Station ID and interval signal. News and update on Bosnia/Croatian war. English news sign-off at 0105. (Bellovich, FL) Heard at 2358-0000 on 7370// 13830 in Croatian/English. (Sue Wilden, Columbus, IN)

0105 UTC on 7250
RUSSIA: Voice of Vietnam via Tbilisskaya relay. Political and economic news. Report on upcoming Vietnamese trip for Washington's governor. (William McGuire, Cheverly, MD)

0150 UTC on 9860
TADZHIKISTAN: Radio Netherlands relay. Discussion on today's Dutch society to Lennon's *Imagine* song. Very weak signal with final fade-out at 0205. (GVH, NC)

0205 UTC on 6135
SWITZERLAND: Swiss Radio Intl. World and regional newscast with very good signal quality. (McGuire, MD; Zamora, NM; Hillton, SC)

0336 UTC on 6185
GERMANY: Deutsche Welle. Closing segment of *Inside Europe* program to DW info. (Wilden, IN)

0405 UTC on 7465
ISRAEL: Kol Israel. Report on Bosnian bombings. (McGuire, MD; Fraser, MA; Vincent, NE)

0555 UTC on 7280
FRANCE: Radio France Intl. *New Age* music program to time signal pips. Station ID to French newscast. (Wilden, IN; Brian Bagwell, St. Louis, MO; Hillton, SC)

0601 UTC on 7385
COSTA RICA: Radio for Peace Intl. Membership information to *Voices of Our World* program. (Wilden, IN)

0620 UTC on 7255
NIGERIA: Voice of Nigeria. Regional African vocals to travelogue program. Program preview to frequency quote and 0630 newscast. (Wilden, IN)

1115 UTC on 3315
PAPUA NEW GUINEA: (Admiralty Islands) **Radio Manus**. Pidgin. Regional island pop vocals with DJ breaks. PNG's **Radio Madang** (New Guinea) heard on 3260 at 1120, with news briefs and conversations. (GVH, NC)

1123 UTC on 4753
INDONESIA: (Celebes) RRI Ujung Pandang. Indonesian. Pop Indo vocals to announcement break at 1134. Gamelan music and intros to 1155. "SCI" (*Song of the Coconut Islands*) interval signal at 1159. Time tips to Jakarta network news relay, 1200-1214. Regional program segment, audible to 1230. (Sam Wright, Biloxi, MS)

1130 UTC on 11995
PHILIPPINES: Voice of America relay. English/Chinese language lesson program. VOA ID at 1200. (John Hanz, Old Bridge, NJ)

1130 UTC on 15400
FINLAND: YLE/Radio Finland. Report on Finland's reaction to ongoing Bosnian conflict, and Finland's economic report. (McGuire, MD) Sign-on 1230 on 15400 with Finnish press review and *Northern Lights* show. (Bellovich, FL)

1135 UTC on 3325
INDONESIA: (Kalimantau) **RRI Palang Karaya**. Indonesian. Tentative ID on this Borneo site with Indonesian music. Additonal tentative Indo's observed as **RRI Ternate** (Moluccas) on 3345 at 1137; **RRI Pontianak** (Kalimantau) on 3976.03 heard at 1140 amid amateur radio interferences. (Wright, MS)

1154 UTC on 4890
PAPUA NEW GUINEA: (Papua) NBC. Pidgin. American pop music program to time tips at 1200. Frequency quote information, and national anthem sign-off. (Zamora, NM)

1216 UTC on 15445
BRAZIL: Radiobras. National banking report. Hit song by Brazil's popular group *The Angels of Hell.* Canned Nacional ID to report on the national social security reform bill. Recheck on 15265 at 1806-1810 with fair signal and co-channel interference. (GVH, NC; Bellovich, FL)

1306 UTC
SAUDI ARABIA: BSKSA. Arabic. Vocals to announcer's program updates. Arabic and pop vocals to news updates at 1420. Presumed BSKSA's programming as follows; Holy Koran on 15165 at 1406, 15175 at 1410, 15345 at 1511. (Tom Banks, Dallas, TX)

1312 UTC on 15375
OMAN: Radio Sultanate of Oman. Arabic. Talk to clear station ID and mention of Muscat, Oman. Emotional radio drama about Muhammed. Lady announcer intros an Arabic music program. Signal quality a great S9 with minimal fading. Program segments using hip hop tune *No Limit* by artist *2 Unlimited.* Station sign-off at 1358. No sign of Oman's 11890 sign-on at 1400. (GVH, NC)

1315 UTC on 5995
AUSTRALIA: Radio Australia. *Oz Sounds* program with host Dick Patterson. Featured report on the ongoing debate of nuclear testing in the Pacific. (Zamora, NM) Heard at 0643 on 9860. (Wilden, IN; Bellovich, FL)

1346 UTC on 9635
SINGAPORE: Radio Singapore Intl. Tentatively identified as Malay language for pop music program and chat. Easy listening music to 1350 news update. Frequency/ID information to 1400*. (Zamora, NM)

1403 UTC on 9890
MADAGASCAR: Radio Netherlands relay. *Bats, Balls and Baselines* sports program to frequency quote. *Newsline* update to *Sounds Interesting* program. (Zamora, NM) Netherlands Antilles relay on 15315 at 1859.(Wilden, IN)

1412 UTC on 15415
LIBYA: Radio Jamahiriya. Arabic. Male reading presumed news items to Arabic music instrumentals. Text audible amid audio buzz, // 15235 at 1506 of considerably better signal quality. (GVH, NC)

1428 UTC on 11780
BRAZIL: Radio Nacional da Amazonia. Portuguese. Male/female duo with mid morning show. News updates on Sao Paulo, Brasilia and Mato Grosso. Numerous promotionals and phone numbers to Braz pop vocals. "Nacional" ID at 1435. Great signal for rechecks at 1630, 1750 and 2015. (Don Taylor, Green Cove Springs, FL)

1513 UTC on 9810
SEYCHELLES: FEBA. News report on AIDS to 1520, followed by report on the secret service. (Frederic Collin, Tokyo, Japan)

1614 UTC on 15175
YUGOSLAVIA: Radio Yugoslavia. Pitch for monetary contributions to the Red Cross to 1619. Pop music to sign-off ID at 1628. (Collin, Japan)

1630 UTC on 9560.3
ETHIOPIA: Radio Ethiopia. News report to "Radio Ethiopia" ID at 1637. Program feature *Introducing Ethiopia* about the early discoveries in Ethiopia made by Italian, French and American archaeologists. (Jerry Witham, Keaau, HI)

1705 UTC on 4895.6
PAKISTAN: Pakistan BC Corp. News with ID in presumed Pakistani language extending to 1715. Brief program resembling a documentary film track. (Witham, HI)

1709 UTC on 15475
GABON: **Afrique Numero Un**. French. African sports news to international topic update. (Collin, Japan) **Radio Japan's Gabon** relay noted on 11865 at 2115. (Hanz, NJ)

1710 UTC on 7530
MONGOLIA: Radio Ulaan Baatar. Russian. Far-eastern music with comments by a female announcer, 1730* with mentions of Mongolia and Ulaan Baatar. (Witham, HI)

1735 UTC on 7070
IRAQ: (Clandestine) Voice of the Mojahed. Tentative logging on Persian broadcast. Male announcer in monologue, interrupted occasionally by a musical bridge and female's program updates. Easily heard over jammer. (Witham, HI)

1820 UTC on 15115
INDIA: Air-Aligarh. Hindu. Regional news and information. Indian subcontinental music to announcer's talk. SINPO=43233. (Gerry Le Strange, East Brunswick, NJ)

2315 UTC on 4875
BRAZIL: **Super Radio Roaima**. Portuguese. DJ's soccer commentary. Station ID and jingle at 2320. Parallel game on presumed **Radio Anhanguera**, under GBC Ghana at 2325. No sign of Anhanguera's // frequency on 6080.

2337 UTC on 5025
CUBA: **Radio Rebelde**. Spanish. Male/female announcer's trade national news topics to Cuban salsa music. Time check at 2345 to product jingles. (Banks, TX) **Radio Havana** noted on 6000 at 0329. (Fraser, MA; Wilden, IN)

2342 UTC on 4915
GHANA: GCB. African balo music to English service at 2345. Lady's ID into national newscast and regional news about Ghana's schools and agriculture. Talk to closing ID, choral hymn, and national anthem at 0000*. (Wright, MS)

2357 UTC on 6090
BRAZIL: Radio Bandeirantes. Portuguese announcer with soccer commentary. Interference from VOA ID at 2359. (Hillton, SC)

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times.*
English broadcast unless otherwise noted.

The QSL Report

SHORTWAVE BROADCASTING

Gayle Van Horn

Most Wanted List

I admit it ... I am a dedicated QSL collector. The more difficult a confirmation is to obtain, the more obsessive my quest for that reply!

Yes, things can get discouraging after a number of attempts to verify a station, with nothing to show for your persistence.

Why not create your own *Most Wanted List*—a list of your most difficult QSLing problem stations. By posting the list near your receiver, chances are its presence will remind you to reconsider these stations and perhaps try a new reporting approach.

As you verify each station, mark them off your list and continue to work the remaining stations. As your list of *most wanted* declines, you'll be determined to complete your own quest for replies.

Your personal *Most Wanted List* can bring surprising results!

ALBANIA

Radio Tirana, 7160 kHz. Partial data (freq/date) paper QSL card signed by Altin Kudari-English Section. Albanian paper flag enclosed. Received in 25 days after an English follow-up report, and one U.S. dollar. Station address: Radiotelevisione Shiqiptar, International Service, Rrug Ismail Qemali, Tirana, Albania. (Randy Stewart, Springfield, MO)

AUSTRALIA

Radio Australia. Full data QSL card signed, plus station program schedule. Received in 18 days for an English report and souvenir postcard. Station address: GPO Box 755, Glen Waverly, VIC 3150, Australia. (Jennifer Hull, New York, NY)

CANADA

Radio Japan/NHK via Sackville, Canada relay. Full data QSL card signed, plus a wallet calendar, *Radio Japan News*, station program schedule and aerogram. Received in 17 days for an English report. Station address: 2-2-1 Jinnan Shibuya-ku, Tokyo 150-01, Japan. (Hull, NY)

CZECH REPUBLIC

Radio Prague, 5930/7345 kHz. Full data scenery card unsigned, plus a program schedule and *DX Club* brochure. Received for an English report. Station address: Cesky Rozhlas/Vinohradska 12/12099 Praha 2, Czech Republic. (Robert G. Knight, Garfield, NJ)

HUNGARY

Rado Budapest, 11910 kHz. Full data QSL card unsigned plus *Budapest International* publication. Received in 37 days for a taped English report and one IRC. Station address: Brody Sandor, utca 5-7, H-1800 Budapest, Hungary. (Walter Szczepaniak, Philadelphia, PA; Hull, NY)

KIRIBATI

Radio Kiribati, 9825 kHz. Two full data letters received separately for reports covering two days, signed by Engineer in Charge. Received in 341 days total (124 days after a follow-up report) for an English report, one U.S. dollar and address label sent with original report and follow-up report. Station address: Broadcasting & Publications Authority, P.O. Box 78, Bairiki, Tarawa, Rep. of Kiribati. (Mike Hardester, Jacksonville, NC)

KUWAIT

Radio Kuwait, 11990/9840/15505 kHz. Full data *Don't Forget Our POWs* QSL sheet signed with initials, plus a station info sheet. Received in 68/77 days for an English report, 4 IRCs and souvenir postcards. Station address: Engineering Communications Dept., Controller of Frequency Management, P.O. Box 397, Safat, 13004 Safat, Kuwait. (Ernest T. Bagley Sr., So. Portland, ME; Patrick M. Griffith, Federal Heights, CO; Claude Turner, Chicago, IL)

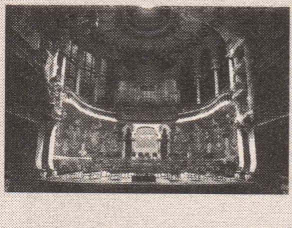
MEDIUMWAVE

WGTA, 950 AM kHz. Full data prepared QSL signed by station President. Received in 14 days for an English AM report and return mint postage. Station address: P.O. Box 200, Summerville, GA 30747. (Loyd Van Horn, Brasstown, NC)

WHAS, 840 AM kHz. Full data station logo card, unsigned. Received in 11 days for an English AM report. Station address: 520 W. Chestnut St., Louisville, KY 40202 (or: P.O. Box 1084, zip 40201) Ph# 502-582-7840. (Robert G. Knight, Garfield, NJ)

MOROCCO

Voice of America relay, 15410 kHz. Full data oversized scenery card of Chesapeake Bay, unsigned. *VOA Guide* newsletter enclosed. Received in 25 days for an English report. Report mailed to 330 Independence Ave., Washington, DC 20547; however, reply from B/K G759A Cohen, Washington, DC 20547. (Stewart, MO)



NORTHERN MARIANA ISLANDS

Saipan: KHBI-Monitor Radio International, 9355 kHz. Full data antenna/studio QSL card with illegible signature. Received in 125 days for an English report and return mint postage. Report sent to Boston address (P.O. Box 860, zip 02123) However, card mailed from Saipan. Station address: Box 1387, Commonwealth of the Northern Marianas Islands, MP 96950. (Stewart, MO) *Quicker route for QSLs is to mail your report directly to Saipan. -ed.*

PAKISTAN

Pakistan Broadcasting Corp., 9796 kHz. Full data QSL on station letterhead signed by Syed Abrar Hussain-Senior Broadcast Engineer, plus a mountain scenery postcard with note attached. Received for an English report and souvenir postcard. Station address: Broadcasting House, Constitution Ave., Islamabad, Pakistan. (Gigi Lytle, Lubbock, TX)

SHIP TRAFFIC

CSS Alfred Needler CG2683, 156.8/157.2 MHz (Scientific Research Vessel). Full data prepared QSL card verified plus a vessel fact sheet. (by far my most distant ship on VHF radio of 605 miles!) Received in 31 days for an English utility report and return mint postage. Ship address: c/o Bedford Institute of Oceanography, P.O. Box 1006, Dartmouth, NS Canada B2Y 4A2 (Hank Holbrook, Dunkirk, MD)

Howell Lykes WCIP, 156.7 MHz (Steam Container). Full data QSL letter. Received in 15 days for an English utility report and return mint postage. Ship address: Lykes Bros. Steamship Co., Inc., 8866 Gulf Freeway, Houston, TX 77017. (Holbrook, MD)

New York Sun WSKD, 156.7 MHz (Oil Tanker). Two page letter signed by T. J. O'Brien-AC4HW. Photo of vessel enclosed, as well as my return postage! Received in 26 days for an English utility report and return mint postage. Ship address: Sun Transport Inc., Delaware Avenue & Green St., P.O. Box 1078, Marcus Hook, PA 19061-1078. (Holbrook, MD)

SPAIN

Radio Exterior España, 11815 kHz. QSL card stamped with station's seal, unsigned. Received in 79 days for an English report and one IRC. Station address: Apartado 156.202, 28080 Madrid, Spain. (Turner, IL)

SWEDEN

Radio Sweden, 15240 kHz. Full data scenery card unsigned. Received in 29 days for an English report. Station address: S-105 10, Stockholm, Sweden. (Knight, NJ; Turner, IL)

TRAVELERS INFORMATION STATION (TIS)

WPHE 255, 1610 AM kHz, Durham, NC. (Duke University Medical Center). Full data prepared QSL card signed by John LeMay-KB4WGA. Received in 13 days for an English report, address label (used on reply) and return mint postage. Station address: c/o Duke University, Atten: John LeMay, Dept. of Information Technology, Box 90211, Durham, NC 27708. (Hardester, NC)

KID 771, 530 AM kHz, Deep Creek, NC. (Gatlinburg, TN). Full data prepared QSL card signed by W. Eugene Cox. Received in 8 days for an English report and return mint postage. Station address: Great Smoky Mt. National Park, Gatlinburg, TN 37738. (Holbrook, MD)

UNITED STATES

WVHA, Greenbush, ME 9852 kHz. Full data QSL on Prophecy Countdown letterhead, signed by David Evans. Photo of station enclosed. Received in 10 days for an English report and return mint postage. Station QSL address: P.O. Box 1844, Mount Dora, FL 32757. (Darren, White, Hattiesburg, MS)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 3, 4, 5 or 6 hours for Eastern, Central, Mountain or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC; for example, the BBC's "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 pm Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday
M: Monday
T: Tuesday
W: Wednesday
H: Thursday
F: Friday
A: Saturday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas
na: North America
ca: Central America
sa: South America
eu: Europe
af: Africa
me: Middle East
as: Asia
au: Australia
pa: Pacific
va: various
do: domestic broadcast
om: omnidirectional

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

RADIO PROGRAMS

Sundays

0025	Radio Exterior de Espana: "Distance Unknown"
0030	Voice of America (ca): "Communications World"
0036	Radio Vlaanderen Int'l: "Radio World"
0109	HCJB (am): "DX Partyline"
0124	Radio Exterior de Espana: "Distance Unknown"
0200	Radio For Peace Int'l: "World of Radio"
0200	WWCR #3: "Spectrum"
0230	WWCR #1: "World of Radio"
0234	Radio Havana Cuba: "DXers Unlimited"
0245	Radio Romania Int'l: "DX Mailbag"
0258	Vatican Radio: "On-the-Air"
0350	BBC (af): "Waveguide"
0350	BBC (eu): "Waveguide"
0410	Australia, Radio: "Feedback"
0415	Voice of Turkey: "DX Corner (biweekly)"
0434	Radio Havana Cuba: "DXers Unlimited"
0508	Vatican Radio: "On-the-Air"
0509	HCJB (am): "DX Partyline"
0524	Radio Exterior de Espana: "Distance Unknown"
0525	Radio Japan: "Media Roundup"
0600	WWCR #1: "World of Radio"
0610	Australia, Radio: "Feedback"
0634	Radio Havana Cuba: "DXers Unlimited"
0725	Radio Japan: "Media Roundup"
0735	Radio Vlaanderen Int'l: "Radio World"
0810	Australia, Radio: "Feedback"
0835	Radio Korea: "Shortwave Feedback"
0915	AWR-Europe (Slovakia): "Wavescan"
0930	WWCR #3: "World of Radio"
1000	Radio For Peace Int'l: "World of Radio"
1037	Radio Korea: "Shortwave Feedback"
1100	AWR Latin America: "Wavescan"
1130	WRMI: "Wavescan"
1145	WRMI: "Wavescan"
1235	Radio Korea: "Shortwave Feedback"
1330	FEBC (Philippines): "DX Dial"
1330	WRMI: "Wavescan"
1335	Radio Vlaanderen Int'l: "Radio World"
1352	Vatican Radio: "On-the-Air"
1425	Radio Japan: "Media Roundup"
1635	Radio Korea: "Shortwave Feedback"
1645	BBC (af): "Waveguide"
1725	Radio Japan: "Media Roundup"
1905	Radio Vlaanderen Int'l: "Radio World"
1935	Radio Korea: "Shortwave Feedback"
2115	AWR-Europe (Slovakia): "Wavescan"
2125	Radio Japan: "Media Roundup"
2205	Radio Vlaanderen Int'l: "Radio World"
2215	AWR-Europe (Slovakia): "Wavescan"
2215	Radio Budapest Int'l: "DX Show"
2235	Radio Korea: "Shortwave Feedback"
2245	Radio Bulgaria: "Radio Bulgaria Calling"
2252	Vatican Radio: "On-the-Air"
2300	AWR Latin America: "Wavescan"
2300	KSDA (Guam): "Wavescan"
2300	Radio For Peace Int'l: "World of Radio"
2325	Radio Japan: "Media Roundup"

Mondays

0000	WRMI: "Wavescan"
0115	WRMI: "Wavescan"
0125	Radio Japan: "Media Roundup"
0134	Radio Korea: "Shortwave Feedback"
0345	Radio Budapest Int'l: "DX Show"
0400	WWCR #1: "Ham Radio and More"
0430	Radio New Zealand Int'l: "Mailbox (biweekly)"
0545	Radio Bulgaria: "Radio Bulgaria Calling"
0620	Voice of Med. (Malta): "VOM DX Corner"
0640	Radio Korea: "Shortwave Feedback"
0700	Radio For Peace Int'l: "World of Radio"
0720	Voice of Med. (Malta): "VOM DX Corner"
0900	WWCR #1: "Ham Radio and More"
1040	All India Radio: "DX-ers Corner (2/4)"
1315	Radio Bulgaria: "Radio Bulgaria Calling"
1420	Voice of Med. (Malta): "VOM DX Corner"
1435	All India Radio: "DX-ers Corner (2/4)"
1520	Voice of Med. (Malta): "VOM DX Corner"
1615	KTWR: "Pacific DX Report"
1840	All India Radio: "DX-ers Corner (2/4)"
1920	AWR Latin America: "Wavescan"
2015	Radio Tallinn: "Radio Estonia DX Program"
2130	All India Radio: "DX-ers Corner (2/4)"
2240	Radio Exterior de Espana: "Distance Unknown"
2345	BBC (as pac): "Waveguide"

Tuesdays

1230	WWCR #1: "World of Radio"
1247	Radio Sweden: "Media Scan"
1349	Radio Romania Int'l: "For Radio Amateurs"
1349	Radio Sweden: "Media Scan"
1449	Radio Sweden: "Media Scan"
1849	Radio Sweden: "Media Scan"
1900	Radio For Peace Int'l: "World of Radio"
2050	Polish Radio: "Polish Radio DX Club"
2139	Radio Havana Cuba: "DXers Unlimited"
2149	Radio Sweden: "Media Scan"
2239	Radio Havana Cuba: "DXers Unlimited"
2249	Radio Sweden: "Media Scan"
2340	All India Radio: "DX-ers Corner (2/4)"

Wednesdays

0030	WRMI: "Wavescan"
0049	Radio Sweden: "Media Scan"
0135	Radio Havana Cuba: "DXers Unlimited"
0149	Radio Sweden: "Media Scan"
0220	Argentina, RAE: "DX'ers Special"
0249	Radio Sweden: "Media Scan"
0300	Radio For Peace Int'l: "World of Radio"
0335	Radio Havana Cuba: "DXers Unlimited"
0349	Radio Sweden: "Media Scan"
0535	Radio Havana Cuba: "DXers Unlimited"
0700	HCJB (eu): "The Latest Catch"
0800	HCJB (eu): "Ham Radio Today"
0811	Radio Prague: "Calling All Listeners"
0930	HCJB: "Ham Radio Today"
1011	Radio Prague: "Calling All Listeners"
1030	HCJB: "The Latest Catch"
1100	Radio For Peace Int'l: "World of Radio"
1144	Radio Prague: "Calling All Listeners"
1315	FEBC (Philippines): "DX Dial"
1411	Radio Prague: "Calling All Listeners"
1530	BBC (south as): "Waveguide"
1711	Radio Prague: "Calling All Listeners"
1730	HCJB (eu): "Ham Radio Today"
1800	HCJB (eu): "The Latest Catch"
1811	Radio Prague: "Calling All Listeners"
1820	Polish Radio: "Polish Radio DX Club"
1920	Argentina, RAE: "DX'ers Special"
2015	Radio Budapest Int'l: "DX Show"
2030	WRMI: "Wavescan"
2110	Radio Prague: "Calling All Listeners"
2244	Radio Prague: "Calling All Listeners"

Thursdays

0014	Radio Prague: "Calling All Listeners"
0030	WRMI: "Wavescan"
0114	Radio Prague: "Calling All Listeners"
0130	HCJB (am): "Ham Radio Today"
0152	Radio Netherlands Int'l: "Media Network"
0200	HCJB (am): "The Latest Catch"
0215	Radio Budapest Int'l: "DX Show"
0235	Argentina, RAE: "DX'ers Special"
0314	Radio Prague: "Calling All Listeners"
0344	Radio Prague: "Calling All Listeners"
0530	HCJB (am): "Ham Radio Today"
0600	HCJB (am): "The Latest Catch"
0752	Radio Netherlands Int'l: "Media Network"
0830	Radio New Zealand Int'l: "Mailbox (biweekly)"
0953	Radio Netherlands Int'l: "Media Network"
1153	Radio Netherlands Int'l: "Media Network"
1320	Polish Radio: "Polish Radio DX Club"
1353	Radio Netherlands Int'l: "Media Network"
1553	Radio Netherlands Int'l: "Media Network"
1753	Radio Netherlands Int'l: "Media Network"
1952	Radio Netherlands Int'l: "Media Network"

Fridays

0005	BBC (south as): "Waveguide"
0030	WRMI: "Wavescan"
0053	Radio Netherlands Int'l: "Media Network"
0252	Radio Netherlands Int'l: "Media Network"
0430	BBC (as pac): "Waveguide"
0453	Radio Netherlands Int'l: "Media Network"
1235	BBC (am): "Waveguide"
1245	Radio Finland: "YLE Media Roundup"
1345	Radio Finland: "YLE Media Roundup"
1346	Radio Portugal Int'l: "Radio Portugal DX (triweekly)"
1645	Radio Finland: "YLE Media Roundup"
1916	Radio Portugal Int'l: "Radio Portugal DX (triweekly)"
1930	AWR Latin America: "Wavescan"
1930	Radio New Zealand Int'l: "Mailbox (biweekly)"
2000	Radio For Peace Int'l: "World of Radio"
2045	Radio Bulgaria: "Radio Bulgaria Calling"
2115	WWCR #1: "World of Radio"
2210	Australia, Radio: "Feedback"

Saturdays

0010	Australia, Radio: "Feedback"
0045	Radio Bulgaria: "Radio Bulgaria Calling"
0146	Radio Portugal Int'l: "Radio Portugal DX (triweekly)"
0210	Australia, Radio: "Feedback"
0235	Argentina, RAE: "DX'ers Special"
0400	Radio For Peace Int'l: "World of Radio"
0715	BBC (as pac): "Waveguide"
0715	BBC (south as): "Waveguide"
0739	HCJB (eu): "DX Partyline"
0815	KTWR: "Pacific DX Report"
0910	HCJB: "DX Partyline"
0940	KTWR: "Pacific DX Report"
0940	FEBC (Philippines): "DX Dial"
1000	BBC (south as): "Waveguide"
1030	Voice of America (as pac): "Communications World"
1200	Radio For Peace Int'l: "World of Radio"
1230	Voice of America (as pac): "Communications World"
1300	WWCR #1: "World of Radio"
1315	Radio Bulgaria: "Radio Bulgaria Calling"
1342	Radio Tashkent: "DX Program"
1345	Voice of Turkey: "DX Corner (biweekly)"
1347	Radio Romania Int'l: "DX Mailbag"
1607	WWCR #3: "Ham Radio and More"
1709	HCJB (eu): "DX Partyline"
1730	Voice of America (af): "Communications World"
1730	Voice of America (as pac): "Communications World"
1730	Voice of America (me): "Communications World"
1730	Voice of America (south as): "Communications World"
1800	Radio For Peace Int'l: "World of Radio"
1945	Radio Romania Int'l: "DX Mailbag"
2100	WRMI: "Wavescan"
2130	Voice of America (me): "Communications World"
2137	Radio Havana Cuba: "DXers Unlimited"
2145	Voice of Turkey: "DX Corner (biweekly)"
2200	WRMI: "Wavescan"
2215	WRMI: "Wavescan"
2220	Radio Exterior de Espana: "Distance Unknown"
2236	Radio Havana Cuba: "DXers Unlimited"
2300	HRJA Honduras: "Wavescan"
2300	KSDA (Guam): "Wavescan"
2315	Voice of Turkey: "DX Corner (biweekly)"

SHORTWAVE GUIDE

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Next Reporting Deadline
November 20, 1995

Jim Frimmel, Program Manager
Texas

Dave Datko
California

Jeff Demers
New Hampshire

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(7:00 PM EST, 4:00 PM PST)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (south as)
Canada (North-Quebec) [S]
China Radio Intl
Croatian Radio
Monitor Radio Intl [T-A]
Radio Australia
Radio Bulgaria
Radio Exterior de Espana
Radio New Zealand Intl
Radio Prague
Radio Thailand
Radio Ukraine Intl
Radio Vilnius
Radio Yugoslavia [M-A]
Voice of America (am)
Voice of America (as)
Voice of America (ca)
Voice of Russia
WHRI (Indiana) [T-A]
0003
Radio Pyongyang
0010
China Radio Intl*
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
All India Radio
Radio Netherlands Intl
Radio New Zealand Intl [M-F]
Radio Sweden [T-A]
Radio Thailand [T-S]
Radio Vlaanderen Intl
Voice of America (am) [T-S] (Special English)
Voice of America (as) (Special English)
Voice of Russia
0045
BBC (am)*
BBC (as pac)*
BBC (south as)*
0050
RAI Italy

0100 UTC
(8:00 PM EST, 5:00 PM PST)
BBC (am) (Newsdesk)
BBC (as pac)
BBC (south as) (Newsdesk)
Canada (North-Quebec)
Croatian Radio
Deutsche Welle
HCJB (am)
Monitor Radio Intl [T-A]
R Slovakia Intl [A]*
R Slovakia Intl [S/T-F]
Radio Australia
Radio Canada Intl
Radio Exterior de Espana
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Intl
Radio Norway Intl [M]
Radio Prague
Swiss Radio Intl
Voice of America (am)
Voice of America (as)
Voice of America (ca)
Voice of Indonesia
Voice of Russia
Voice of Vietnam
0110
Radio Australia [M-F]*
0113
Radio Havana Cuba [T-S]*
0130
Radio Austria Intl
Radio Havana Cuba [T-S]
Radio Netherlands Intl
Radio Portugal Intl [T-A]
Radio Sweden [T-A]
Voice of Greece
Voice of Russia
Voice of Vietnam
0145
Radio Tirana
0155
Voice of Indonesia

0200 UTC
(9:00 PM EST, 6:00 PM PST)
BBC (af) (Newsday)
BBC (am) (Newsday)
BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as) (Newsday)
Canada (North-Quebec) [S]
Croatian Radio
Deutsche Welle
Monitor Radio Intl [T-A]
Radio Australia
Radio Budapest
Radio Havana Cuba [T-S]
Radio New Zealand Intl [M-A]
Radio Romania Intl
RAE Argentina [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
Voice of Russia
Voice of Vietnam
0203
Voice of Free China
0212
Radio Havana Cuba [T-S]*
0215
Radio Cairo
Radio Nepal
0228
Radio Havana Cuba [S]
0230
Radio Austria Intl
Radio Havana Cuba [T-A]
Radio Netherlands Intl
Radio Pakistan
Radio Sweden [T-A]
Radio Tirana
Voice of Russia [T-A]
Voice of Vietnam
0255
Radio Canada Intl [T-A]

0300 UTC
(10:00 PM EST,7:00 PM PST
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [S-F]
BBC (south as)
Canada (North-Quebec)
Channel Africa
China Radio Intl
Croatian Radio
Deutsche Welle
Monitor Radio Intl [T-A]
Radio Australia
Radio Canada Intl
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Intl [M-A]
Radio Norway Intl [M]
Radio Prague
Radio Thailand
Voice of America (af) [A-S]
Voice of Russia
WHRI (Indiana) [T-A]
WWCR #3 (Tennessee) [T-A]
0301
Voice of America (af) [M-F]*
0303
Voice of Free China
0310
China Radio Intl*
0313
Radio Havana Cuba [T-S]*
0315
Radio Cairo
0320
Radio Philipinas [M-A]
0330
BBC (eu) [A]
Radio Budapest
Radio Dubai
Radio Havana Cuba [T-S]
Radio Prague
Radio Sweden [T-A]
Voice of America (af) [M-F] (Special English)
Voice of Russia
0340
BBC (af) [S]*
Voice of Greece
0355
Radio Japan [W-M]

0400 UTC
(11:00 AM EST, 8:00 PM PST)
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac)
BBC (eu) [S-F] (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec)
Channel Africa
China Radio Intl
Croatian Radio
Deutsche Welle
Monitor Radio Intl [T-F]
Radio Australia
Radio Canada Intl
Radio Havana Cuba [T-S]
Radio New Zealand Intl [A]
Radio New Zealand Intl [M-F]*
Radio Romania Intl
Radio Tanzania
Radio Ukraine Intl
Radio Yugoslavia
Swiss Radio Intl
Voice of America (af)
Voice of America (me)
Voice of Russia
Voice of Turkey
WHRI (Indiana) [T-A]
WWCR #3 (Tennessee) [T-A]
WYFR (Satellite Network) [A]
ZBC Zimbabwe
0403
Radio Pyongyang
0410
China Radio Intl*
0412
Radio Havana Cuba [T-S]*
0425
RAI Italy
0430
BBC (af) [A-S]*
BBC (eu) [A] (Newsdesk)
Radio Havana Cuba [T-A]
Radio Netherlands Intl
Voice of Russia
0431
Voice of America (af) [M-F]*

0500 UTC
(12:00 AM EST, 9:00 PM PST)
BBC (af) (Newsday)
BBC (am) (Newsday)
BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as)
Canada (North-Quebec)
Channel Africa
China Radio Intl
Deutsche Welle
HCJB (am)
Monitor Radio Intl [T-F]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Exterior de Espana
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Intl [S-F]
Voice of America (af)
Voice of America (me)
Voice of Israel
Voice of Russia
0510
China Radio Intl*
Radio Australia [M-F]*
0513
Radio Havana Cuba [T-S]*
0530
BBC (af) [A-S]*
Radio Austria Intl
Radio Havana Cuba [T-A]
Radio Romania Intl
Voice of Nigeria
Voice of Russia
0555
Radio Japan [A]

0600 UTC
(1:00 AM EST, 10:00 PM PST)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec)
Deutsche Welle
Monitor Radio Intl [T-F]
Radio Australia
Radio Canada Intl [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Intl [M-A]
Swiss Radio Intl
Voice of America (af) [A-S]
Voice of America (me)
Voice of Kenya

Voice of Malaysia
Voice of Russia
WWCR #1 (Tennessee) [T-A]
0601
Voice of America (af) [M-F]*
0603
Croatian Radio
Radio Pyongyang
0612
Radio Havana Cuba [T-S]*
0628
Radio Havana Cuba [S]
0630
BBC (af) [A-S]*
Radio Austria Intl [T-S]
Radio Havana Cuba [T-A]
Voice of Nigeria [M-F]
Voice of Russia
0632
Radio Romania Intl
0645
Radio Romania Intl
Voice of Nigeria [M-F]*
0655
Radio Japan [W-M]
Voice of Med. (Malta) [M-F]

0700 UTC
(2:00 AM EST, 11:00 AM PST)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
KWHR (Hawaii) [M-F]
Monitor Radio Intl [T-F]
Papua New Guinea
Radio Australia
Radio Japan
Radio New Zealand Intl [A]
Radio New Zealand Intl [M-F]*
Radio Norway Intl [S]
Voice of Myanmar (Burma)
Voice of Russia
0703
Radio Pyongyang
Voice of Free China
0710
Radio Australia [M-F]*
0730
HCJB (eu)
Radio Netherlands Intl
Radio Prague
Radio Vlaanderen Intl
Voice of Greece
Voice of Russia
0750
Radio New Zealand Intl [M-F]*
0755
Radio Japan
Voice of Med. (Malta) [M-F]

0800 UTC
(3:00 AM EST,12:00 AM PST)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
KNLS (Alaska)
Monitor Radio Intl [M-A]
Radio Australia
Radio Korea
Radio New Zealand Intl
Radio Pakistan
Radio Prague
Voice of Indonesia [A-H]
Voice of Malaysia
Voice of Russia
WWCR #1 (Tennessee) [M]
WWCR #3 (Tennessee) [S]
0803
Croatian Radio
Radio Pyongyang
0810
Radio New Zealand Intl [M-F]*
0830
R Slovakia Intl
Radio Austria Intl [T-S]
Radio Netherlands Intl
Voice of Armenia [S]
Voice of Russia [M-A]
0855
Voice of Indonesia [A-H]

0900 UTC
(4:00 AM EST, 1:00 AM PST)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
China Radio Intl
Deutsche Welle
HCJB (pac)
Monitor Radio Intl [M-A]
Papua New Guinea [M]*
Radio Australia
Radio Japan
Radio New Zealand Intl [M-A]
Swiss Radio Intl
Voice of Russia
WWCR #1 (Tennessee) [M-F]
0910
China Radio Intl*
Radio Australia [M-F]*
0930
FEBC (Philippines) [M-A]
Radio Netherlands Intl
Voice of Russia
0945
Deutsche Welle [M-F]*
0950
Russia (Radio Pacific Ocean) [A]
0955
Radio Japan

1000 UTC
(5:00 AM EST, 2:00 AM PST)
All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
China Radio Intl
Monitor Radio Intl
Papua New Guinea
Radio Australia
Radio New Zealand Intl [S-F]
Radio Prague
Radio Tanzania
Radio Vlaanderen Intl [M-A]
Voice of America (as)
Voice of America (ca)
Voice of Kenya
Voice of Russia
Voice of Vietnam
WWCR #1 (Tennessee) [H-F]
WWCR #3 (Tennessee) [A]
WYFR (Satellite Network) [M-A]
1010
China Radio Intl*
Radio New Zealand Intl [M-F]*
1020
Radio New Zealand Intl [H]*
Vatican Radio [M-A]
1030
FEBC (Philippines) [M-F]*
Radio Austria Intl [M-A]
Radio Dubai
Radio Korea
Radio Netherlands Intl
Voice of Nigeria
Voice of Russia
WYFR (Satellite Network) [M-F]
1045
Voice of Nigeria [A-S]*

1100 UTC
(6:00 AM EST, 3:00 AM PST)
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) [H-T] (Newsdesk)
Deutsche Welle
Monitor Radio Intl [M-A]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
Radio Mozambique
Radio New Zealand Intl (Newsdesk)
Radio Pakistan
Radio Singapore Intl
Swiss Radio Intl
Swiss Radio Intl (eu)
Voice of America (as)
Voice of America (ca)
Voice of Israel
Voice of Russia
WYFR (Satellite Network) [M-F]
1103
Radio Pyongyang
1110
Radio Australia*
1130
Radio Austria Intl
Radio Netherlands Intl
Radio Prague
Radio Singapore Intl
Voice of Asia
Voice of Russia
WYFR (Satellite Network) [M-F]
1145
Deutsche Welle [M-F]*
1155
Radio Japan [S-F]

1200 UTC
(7:00 AM EST, 4:00 AM PST)
BBC (af) [M-A]
BBC (am)
BBC (as pac) [M-A]
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
China Radio Intl
Croatian Radio
Monitor Radio Intl [M-A]
Papua New Guinea
Radio Australia
Radio France Intl
Radio New Zealand Intl [H-T]
Radio Singapore Intl
Radio Tashkent
Swiss Radio Intl (eu)
Voice of America (as)
Voice of Russia
WHRI (Indiana) [A]
WWCR #1 (Tennessee) [M-A]
WYFR (Satellite Network) [M-F]
1203
Radio Korea
Voice of Free China
1204
HCJB (am) [M-F]
1210
China Radio Intl*
1215
BBC (af) [M-A]*
BBC (as pac) [M-F]*
BBC (eu)*
BBC (south as) [M-A]*
1230
HCJB (am) [M-F]*
Radio Bangladesh [S-M]
Radio Bulgaria
Radio Cairo
Radio Canada Intl
Radio Finland [M-F]
Radio Netherlands Intl
Radio Singapore Intl
Radio Sweden [M-F]
Voice of Russia
Voice of Vietnam
WYFR (Satellite Network) [M-F]
1231
Radio France Intl [T]*
1240
Voice of Greece

1300 UTC
(8:00 AM EST, 5:00 AM PST)
BBC (af) (Newshour)
BBC (am) (Newshour)
BBC (as pac) (Newshour)
BBC (eu) (Newshour)
BBC (south as) (Newshour)
Canada (North-Quebec) [A-S]
China Radio Intl
KNLS (Alaska)
Monitor Radio Intl [M-A]
Papua New Guinea
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Intl [M-F]
Radio Ghana
Radio Norway Intl [S]
Radio Romania Intl [M-A]
Radio Singapore Intl
Radio Tanzania [A-S]
Swiss Radio Intl
Swiss Radio Intl (eu)
Voice of America (as)
Voice of Kenya
Voice of Russia
WYFR (Satellite Network) [M-F]
1301
Radio Romania Intl [S]
1303
Radio Pyongyang
1310
China Radio Intl*
Radiobras [M-F]*
1324
HCJB (am) [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines) [M-A]
Radio Austria Intl
Radio Canada Intl
Radio Dubai
Radio Finland [M-F]
Radio Netherlands Intl
Radio Portugal Intl [M-F]
Radio Singapore Intl
Radio Sweden [M-F]
Radio Tashkent
Radio Vlaanderen Intl [S]
Voice of America (as) (Special English)
Voice of Russia [M-A]
Voice of Turkey
Voice of Vietnam
1335
Voice of Greece
1355
Radio Singapore Intl

1400 UTC
(9:00 AM EST, 6:00 AM PST)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec) [S]
China Radio Intl
Monitor Radio Intl [M-A]
Radio Australia
Radio Cameroon
Radio Canada Intl [S]
Radio France Intl
Radio Ghana
Radio Japan
Radio Norway Intl [S]
Radio Prague
Radio Vlaanderen Intl [M-A]
Voice of America (as)
Voice of Russia
1410
China Radio Intl*
1415
Radio Nepal
1424
HCJB (am) [M-F]
1430
FEBC (Philippines) [M-A]
Radio Austria Intl
Radio Canada Intl
Radio Netherlands Intl
Radio Romania Intl [T-S]
Radio Sweden [M-F]
RTM Morocco [S]
Voice of Myanmar (Burma)
Voice of Russia
WYFR (Satellite Network) [M-F]
1431
Radio France Intl [T]*
Radio Romania Intl [M]
1440
FEBC (Philippines) [M-F]*
1445
All India Radio
Voice of Myanmar (Burma)
1455
Radio Japan [A]
Voice of Med. (Malta) [M-F]

1500 UTC
(10:00 AM EST, 7:00 AM PST)
BBC (af)
BBC (am)
BBC (as pac) [A-S]
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Intl
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl [S]
Radio Japan
Radio Jordan
Radio Norway Intl [S]
Radio Omdurman
Swiss Radio Intl

Voice of America (as)
Voice of America (me)
Voice of Russia
WWCR #1 (Tennessee) [M-A]
WYFR (Satellite Network) [A]
1503
Radio Pyongyang
1510
China Radio Intl*
1525
Radio Veritas [T-F]
1530
All India Radio*
FEBA (Seychelles)
FEBC (Philippines) [M-A]
Radio Netherlands Intl
Voice of Nigeria [M-H]
Voice of Russia
1540
Radio Veritas [A-M]
1550
Voice of Med. (Malta) [F]
1555
Radio Japan [A]
Radio Veritas [A-M]
Voice of Med. (Malta) [M-H]

1600 UTC
(11:00 PM EST, 8:00 AM PST)

BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Intl
Deutsche Welle
Estonian Radio [M-F]
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl [S]
Radio France Intl
Radio Jordan
Radio Korea
Radio Pakistan
Radio Tanzania
Radio Tirana
Voice of America (af) [A-S]
Voice of America (as)
Voice of America (me)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
Voice of Vietnam
WWCR #1 (Tennessee) [M-F]
WYFR (Satellite Network) [M-A]
1610
China Radio Intl*
1615
Vatican Radio
1630
Channel Africa [F]*
Radio Austria Intl
Radio Canada Intl
Radio Dubai
Radio Finland [M-F]
Voice of America (af) [M-F]*
Voice of America (as) (Special English)
Voice of America (me) (Special English)
Voice of Ethiopia
Voice of Russia
1633
Deutsche Welle [M]*
1638
Deutsche Welle [T-F]*
1645
BBC (am) [S-F]*
BBC (as pac) [M-F]*
BBC (eu) [S-F]*

1700 UTC
(12:00 PM EST, 9:00 AM PST)

BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [A]
BBC (south as)
Canada (North-Quebec) [A]
Channel Africa
China Radio Intl
HCJB (eu)
Monitor Radio Intl [M-A]
Radio Australia
Radio France Intl
Radio Japan
Radio New Zealand Intl [M-F]*
Radio Pakistan
Radio Prague
Swiss Radio Intl
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
WRNO (Louisiana) [M-F]
WWCR #3 (Tennessee) [A]
1703
Radio Pyongyang
1710
China Radio Intl*
Radio Australia*
1715
Radio Sweden
1725
Radio New Zealand Intl [F]*
1730
Radio Netherlands Intl
Radio Romania Intl
Voice of Russia [S-F]
1740
BBC (af)*
1745
Radio Canada Intl [M-F]
Voice of Armenia [M-F]
1755
Radio New Zealand Intl [M-W]*

1800 UTC
(1:00 PM EST, 10:00 AM PST)

All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec) [A]
Monitor Radio Intl [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Cameroon
Radio Mozambique
Radio New Zealand Intl [M-F]*
Radio Omdurman
Radio Prague
Radio Tanzania
Radio Yemen
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Russia
Voice of Vietnam
1830
BBC (af) [A-S]*
R Slovakia Intl
Radio Bangladesh
Radio Kuwait
Radio Netherlands Intl
Radio Sweden [M-F]
Radio Tirana
Radio Yemen
Voice of America (af) [A-S] (Special English)
Voice of America (me) (Special English)
Voice of Russia
1840
Voice of Greece [M-A]
1855
Radio New Zealand Intl [M-H]*

1900 UTC
(2:00 PM EST, 11:00 PM PST)

All India Radio
BBC (af)
BBC (as pac) [M-A]
BBC (eu) [M-A]
China Radio Intl
Deutsche Welle
Monitor Radio Intl [M-A]
Radio Australia
Radio Japan
Radio Korea
Radio New Zealand Intl
Radio Norway Intl [S]
Radio Portugal Intl [M-F]
Radio Romania Intl [T-S]
Radio Vlaanderen Intl
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
Voice of Vietnam
WHRI (Indiana) [M-F]
WWCR #1 (Tennessee) [S-F]
WWCR #3 (Tennessee) [M-F]
1901
Radio Romania Intl [M]
1910
China Radio Intl*
Radio Australia [M-F]*
Radiobras [M-F]*
1930
Deutsche Welle [M-F]*
Radio Austria Intl
Radio Netherlands Intl
Radio Yugoslavia
Voice of Russia
1935
RAI Italy

2000 UTC
(3:00 PM EST, 12:00 PM PST)

BBC (af) (Newshour)
BBC (am)
BBC (as pac) [M-A] (Newshour)
BBC (eu) (Newshour)
China Radio Intl
Deutsche Welle
Estonian Radio [M/H]
Monitor Radio Intl [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio New Zealand Intl
Swiss Radio Intl
Swiss Radio Intl (eu)
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Israel
Voice of Nigeria [M-F]
Voice of Russia
WHRI (Indiana) [M-F]
WWCR #3 (Tennessee) [M-F]
2003
Radio Pyongyang
2007
Radio Damascus [M-F]
2010
China Radio Intl*
Radio New Zealand Intl [S-H]*
2025
RAI Italy
2030
Polish Radio [A-S]
Polish Radio [M-F]*
Radio Netherlands Intl
Radio Thailand
Voice of Vietnam
2055
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(4:00 PM EST, 1:00 PM PST)

All India Radio
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
China Radio Intl
Deutsche Welle
Monitor Radio Intl [M-A]
Radio Australia
Radio Cameroon
Radio Canada Intl
Radio Damascus [F]
Radio Exterior de Espana
Radio Havana Cuba [M-A]
Radio Japan
Radio New Zealand Intl [A-H]
Radio Prague
Radio Romania Intl
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
Voice of Turkey
WHRI (Indiana) [M-F]
2110
China Radio Intl*
Radio Damascus [S-F]
Radio New Zealand Intl [M-H]*
2115
BBC (af)*
BBC (eu)*
2120
Radio Cairo
2130
Radio Cairo
Radio Havana Cuba [M-A]*
Radio Riga Intl [M-F]
Radio Sweden [M-F]
Voice of Russia
2145
Radio Korea
2155
Radio Canada Intl [M-F]

2200 UTC
(5:00 PM EST, 2:00 PM PST)

All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
Canada (North-Quebec) [A-S]
China Radio Intl
Croatian Radio
Monitor Radio Intl [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Canada Intl
Radio Exterior de Espana
Radio Havana Cuba [M-A]
Radio Korea
Radio New Zealand Intl [A-H]
Radio Norway Intl [S]
Radio Ukraine Intl
Radio Vlaanderen Intl [S-F]
Radio Yugoslavia
RAI Italy
Voice of America (as)
Voice of Armenia
Voice of Russia
WWCR #1 (Tennessee) [M-F]
2203
Voice of Free China
2210
China Radio Intl*
2215
Radio Cairo
2230
Radio Austria Intl
Radio Finland
Radio Prague
Radio Sweden [M-F]
Voice of America (as) (Special English)
Voice of Russia [M-F]
2240
Radio Cairo
Voice of Greece [S-F]

2300 UTC
(6:00 PM EST, 3:00 PM PST)

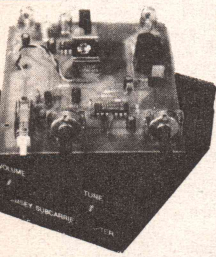
All India Radio
BBC (af) [S-F]
BBC (am) [S-F]
BBC (as pac)
BBC (eu) [S-F]
Canada (North-Quebec) [S]
Croatian Radio
Deutsche Welle
KWHR (Hawaii) [M-F]
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl
Radio Japan
Radio New Zealand Intl [A-H]
Voice of America (as)
Voice of Russia
Voice of Turkey
WHRI (Indiana) [M-F]
2303
Radio Pyongyang
2315
Radio Cairo
2330
Radio Netherlands Intl
Voice of Russia
Voice of Vietnam
2335
Voice of Greece [S-F]

RAMSEY America's #1 Source For Hobby Kits

TONE GRABBER

Grab Touch-Tone numbers right off the air, phone or tape. A simple hook-up to any radio speaker or phone line is all that is required to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

TG-1 Tone Grabber kit	**$99.95**
CTG Matching case set	**$14.95**
TG-1WT Fully assembled TG-1 and case	**$149.95**



SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit	**$27.95**
CSCA Matching case set	**$14.95**
FR-1 FM receiver kit	**$24.95**
CRR Matching case for FR-1	**$14.95**

FM RECEIVER/TRANSMITTER

Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has 5W RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

FM Receiver kit	**$34.95**
Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz)	
CFR Matching case set	**$14.95**
FT-146 Two Meter FM trans kit	**$99.95**

SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on-off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

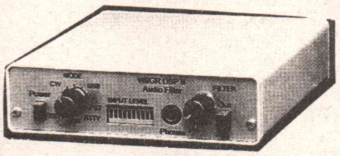
SCN-1 Scanner converter kit	**$49.95**
CSCN Matching case set	**$14.95**
SCN-1WT Assembled SCN-1 and case	**$89.95**

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

SS-70 Scrambler/Descrambler kit	**$39.95**
CSSD Matching case set	**$14.95**
SS-70WT Fully assembled SS-70 and case set	**$79.95**

DSP FILTER



FULLY WIRED & TESTED

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. the remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

W9GR DSP Filter	**$299.95**
12V DC Power Supply	**$11.95**

BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

PR-2 Broadband Preamp, Fully Wired and Tested	**$59.95**

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

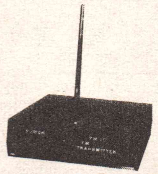
AR-1 Aircraft Receiver Kit	**$29.95**
C-AR Case and Knobset for AR-1	**$14.95**

FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to theantenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a build-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

DF-1 Foxhound direction finder kit	**$59.95**
CDF Matching case set for DF-1	**$14.95**
FHT-1 SlyFox Foxhunt transmitter kit	**$129.95**
FHID-1 Voice ID option	**$29.95**
CFHT Heavy duty metal case set for FHT-1	**$29.95**

STEREO TRANSMITTER



Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

FM-10A Stereo transmitter kit	**$34.95**
CFM Case, whip ant set	**$14.95**

INTERCEPTOR

The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

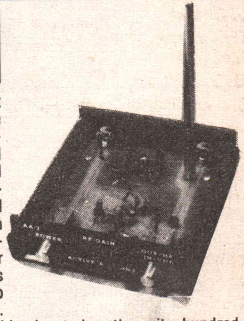
R10 Interceptor, Fully Wired 1 year warranty	**$349.95**

SHORTWAVE CONVERTER

The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switches let you choose easily between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

SC-1 Shortwave Converter Kit	**$27.95**
CSC Matching Case and Knob Set	**$14.95**

ACTIVE ANTENNA

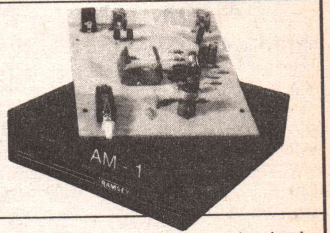


Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack. RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!

AA-7 Kit	**$28.95**
CAA Matching case & knobset	**$14.95**

AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.



AM-1 Transmitter kit	**$29.95**
CAM Matching case set	**$14.95**

SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself-and others-see how you can listen to the world on a receiver you built in an evening.

SR-1 Shortwave Radio Kit	**$34.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555

TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add $4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add $5.00. Orders under $20 add $3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts and labor warranty on wired units

RAMSEY ELECTRONICS, INC.
793 CANNING PARKWAY, VICTOR NY 14564

FREQUENCIES

0000-0030	Australia, Radio	9610as	13605pa	13745as	17750as
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	9700na	11720na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9710na	11715na		
0000-0100	Costa Rica, AWR Alajuela	5030am	6150am	7375am	9725am
		13750am			
0000-0005	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0015	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
0000-0100 f/vl	Italy, IRRS Milan	7125va			
0000-0100	Lebanon, Voice of Hope	6280me			
0000-0100	Lebanon, Wings of Hope	9960va			
0000-0030 as	Lithuania, Radio Vilnius	7360na			
0000-0005 mtwhf	Lithuania, Radio Vilnius	7360na			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100	Palau, KHBN/Voice of Hope	9965as			
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia, Voice of	7125na	7260na	9620na	9720na
		9750na			
0000-0100	Spain, R Exterior Espana	9540na			
0000-0030	Thailand, Radio	9655as	9690af	11905af	
0000-0100	United Kingdom,BBC London	5965as	5970sa	5975va	6175na
		6195as	7325va	9410as	9590va
		9915sa	11750sa	11955as	15280as
		15360as			
0000-0030	United Kingdom,BBC London	7110as	7180as	9580as	11945as
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KWHR Naalehu HI	17510au			
0000-0100	USA, Monitor Radio Intl	7535am	9430ca		
0000-0100	USA, VOA Washington DC	5995na	6130am	7215va	7405na
		9455am	9770va	9775na	
		11695am	11760va	13740am	15185va
		15205am	15290va	17735va	17820va
0000-0100	USA, WEWN Birmingham AL	7425na	15375sa		
0000-0100	USA, WHRI Noblesville IN	5745am	7315am	17510am	
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0025	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5065am	9475am	13845am	
0000-0045	USA, WYFR Okeechobee FL	6085na			
0030-0100	Australia, Radio	9580pa	9660pa	11795as	13605pa
		13755as	15240pa	15365pa	15415as
		15510as	17795pa	17860pa	
0030-0100	Belgium, R Vlaanderen Int	6030na	9925sa		
0030-0100	Ecuador, HCJB Quito	9745am	21455am		
0030-0100	Iran, VOIRI Tehran	6175na	7180na	7260na	9022na
0030-0100	Netherlands, Radio	5905as	7305as	9860as	11655as
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	9850sa		
0030-0100	Thailand, Radio	9655as	11905as	15370as	
0045-0100	USA, WYFR Okeechobee FL	6065na			
0050-0100	Italy, RAI Rome	9645na	11800na		

SELECTED PROGRAMS

Sundays

0005 UK, BBC London (south as): Variable Feature. Special features and new series.
0015 UK, BBC London (south as): Popular Music Feature. Local Heroes (5th). See S 0445.
0015 UK, BBC London (south as): Variable Feature (12th,19th,26th). See S 0005.
0030 UK, BBC London (am): Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
0030 UK, BBC London (as pac/south as): The Learning World. News and views about worldwide education.
0045 UK, BBC London (am/as pac/south as): Britain Today. News about Britain.

Mondays

0005 UK, BBC London (south as): Variable Feature. See S 0005.
0015 UK, BBC London (south as): The Farming World. Reports on new developments from around the world.
0030 UK, BBC London (am): Good Books. Recommendation of a book to read.
0030 UK, BBC London (as pac): Variable Feature. See S 0005.
0030 UK, BBC London (south as): Good Books. See M 0030.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Tuesdays

0005 UK, BBC London (south as): UK Album Chart. Tim Smith counts down the top ten UK album chart and plays the week's highest entries and climbers.
0015 UK, BBC London (south as): Omnibus. See M 1130.
0030 UK, BBC London (am/as pac): Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Wednesdays

0005 UK, BBC London (south as): Variable Feature. See S 0005.
0015 UK, BBC London (south as): Variable Feature. See S 0005.
0030 UK, BBC London (am): The Secret Life of a Song. See H 0545.
0030 UK, BBC London (as pac): Media Feature. A Week on the Web. See T 0530.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Thursdays

0005 UK, BBC London (south as): Variable Feature. See S 0005.
0015 UK, BBC London (south as): From Hoplite to Harrier. See M 0630.
0030 UK, BBC London (am): From Our Own Correspondent. See S 0130.
0030 UK, BBC London (as pac): The Secret Life of a Song. See H 0545.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Fridays

0005 UK, BBC London (south as): Waveguide. See S 0350.
0015 UK, BBC London (south as): Variable Feature. See S 0005.
0030 UK, BBC London (am): The Farming World. See M 0015.
0030 UK, BBC London (as pac): On the Move. See S 0615.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Saturdays

0005 UK, BBC London (south as): Write On. See S 0145.
0015 UK, BBC London (south as): Variable Feature. See S 0005.
0030 UK, BBC London (am): Seven Days. Roundup of the week's news, plus sports highlights, finance and the weather.
0030 UK, BBC London (as pac/south as): From the Weeklies. Review of the British weekly press.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

PROPAGATION FORECASTING

Jacques d'Avignon, VE3VIA
965 Lincoln Drive
Kingston, ON K7M 4Z3
Canada

Distributor ASAPS Propagation Software
E-mail: monitor@limestone.kosone.com

ENGLISH LANGUAGE RADIO IN RUSSIA

According to a listing in the *St. Petersburg Press* (Russia), if you have a multi-band radio with FM, AM, and shortwave you can tune in to various English language shows, including St. Petersburg's own Radio 1 which runs an English language show each weekday.

RADIO MODERN - FM 104 (St. Petersburg) "Borscht & Tears" English language talk, variety for expatriots. Saturdays at 11:15am. Repeated Tuesdays at 16:15pm.

RADIO MAXIMUM -102.8 FM (Broadcast from Moscow) One-hour jazz show in English, Mondays at midnight; Casey Kassem's "Top 40 Countdown," Sundays 9am-1pm.

BBC WORLD SERVICE - Shortwave broadcasts in English. Also on 1260 AM mixed with Russian programs.

VOICE OF AMERICA - Shortwave broadcasts in English. 24 hour VOA on RADIO NEST — 68.66 MHz (St Petersburg)

RADIO 1 - 71.66 MHz - (St. Petersburg) "American Show," weekdays 5pm - 6pm.Hosted by Keith Livingston.
(via Linton Robertson)

FREQUENCIES

0100-0200 twhfa	Argentina, RAE	11710am			
0100-0200	Australia, Radio	9580pa	9660pa	13605pa	13745as
		13755as	15240pa	15245as	15365pa
		15415as	15510as	17715as	17750as
		17795pa	17860pa	17880as	
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200	Australia,DefenseForces R	13525as			
0100-0200 vl	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Canada, RCI Montreal	6120am	9535am	9755am	11940am
		13670am			
0100-0130 vl	Costa Rica, AWR Alajuela	5030ca	6150sa		
0100-0200	Costa Rica, R Peace Intl	7385am	9400am		
0100-0105	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0127	Czech Rep, Radio Prague	7345na	9405na		
0100-0200	Ecuador, HCJB Quito	9745am	21455am		
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9555na
		9640na	9670na		
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0200	Guatemala, Radio Cultural	3300do			
0100-0130	Iran, VOIRI Tehran	6175na	7180na	7260na	9022na
0100-0115 f/vl	Italy, IRRS Milan	7125va			
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	9605na	11840as	11860as	11890as
		11910as	17810as	17845as	
0100-0200	Lebanon, Voice of Hope	6280me			
0100-0200	Lebanon, Wings of Hope	9960va			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0125	Netherlands, Radio	6020na	6165na		
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0130 m	Norway, Radio Norway Intl	6010na			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia, Voice of	9620na	11750na	12050na	13645na
		13665na	13790na	15180na	15425na
		15580as			
0100-0127	Slovakia, R Slovakia Intl	5930na	7300na	9440sa	
0100-0200	South Korea, R Korea Intl	7550eu	11810na		
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, SLBC Colombo	15425as			
0100-0130	Switzerland, Swiss R Intl	5890na	6135na	9885na	9905na
0100-0200	Ukraine, R Ukraine Intl	9750na	9835na	11720na	11780na
		11875na	11950na		
0100-0200	United Kingdom,BBC London	5970sa	5975va	6175na	6195as
		7325va	9410as	9590va	9605as
		9915sa	11750sa	11955as	15360as
0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, VOA Washington DC	5995na	6130na	7405na	9455na
		9775na	13740na	15170na	15205na
		15250na	17740na	17820na	
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na		
0100-0200	USA, WHRI Noblesville IN	5745am	7315am	17510am	
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Vietnam, Voice of	7250na	9840na	15010na	
0100-0130 mtwhfa	Yugoslavia, Radio	9580na	9720af	11870na	
0130-0200	Austria, R Austria Intl	9655na			
0130-0150	Greece, Voice of	7450na	9420na	9935na	
0130-0200	Netherlands, Radio	9860as			
0130-0200	Sweden, Radio	7120as			
0140-0200	Vatican State, Vatican R	9650as	11935as		
0145-0200	Albania, R Tirana Intl	6145na	7160na		

SELECTED PROGRAMS

Sundays

0110 UK, BBC London (as pac): Press Review. A look at what the papers say.
0115 UK, BBC London (as pac): Variable Feature. See S 0005.
0130 UK, BBC London (am): People and Politics. Background to the British political scene.
0130 UK, BBC London (as pac): From Our Own Correspondent. BBC correspondents comment on the background to the news.
0130 UK, BBC London (south as): Breakfast Briefing. News, views, sport, business and press reviews to start the day in South Asia.
0145 UK, BBC London (as pac): Write On. Air your views about World Service; write to PO Box 76, Bush House, Strand, London WC2B 4PH.
0145 UK, BBC London (south as): Letter from America. See S 0030.

Mondays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): Western Philosophers in a Nutshell (6th). See M 0445.
0115 UK, BBC London (as pac): Variable Feature (13th,20th,27th). See S 0005.
0130 UK, BBC London (am): From Hoplite to Harrier. See M 0630.
0130 UK, BBC London (as pac): Anything Goes. See S 1215.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0145 UK, BBC London (south as): Off the Shelf. Daily readings from the best of world literature.

Tuesdays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): Variable Music Feature. See S 0230.
0130 UK, BBC London (am): Omnibus. See M 1130.
0130 UK, BBC London (as pac): Health Matters. See M 0445.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0145 UK, BBC London (south as): Off the Shelf. See M 0145.

Wednesdays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): On Screen. See S 1230.
0130 UK, BBC London (am): Andy Kershaw's World of Music. See S 1230.
0130 UK, BBC London (as pac): Variable Music Feature. See S 0230.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0145 UK, BBC London (south as): Off the Shelf. See M 0145.

Thursdays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): New Ideas. Window on the world of technology, innovation and new products.
0130 UK, BBC London (am): Assignment. A weekly examination of a topical issue.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0135 UK, BBC London (as pac): Variable Feature. See S 0005.
0145 UK, BBC London (as pac): Country Style. See S 1445.
0145 UK, BBC London (south as): Off the Shelf. See M 0145.

Fridays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): Variable Feature. See S 0005.
0130 UK, BBC London (am): Focus on Faith. Alison Hilliard talks to church leaders about their hopes for the future.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0145 UK, BBC London (as pac): Global Concerns. Update on environmental issues.
0145 UK, BBC London (south as): Off the Shelf. See M 0145.

Saturdays

0110 UK, BBC London (as pac): Press Review. See S 0110.
0115 UK, BBC London (as pac): Seven Days. See A 0030.
0130 UK, BBC London (am): Network UK. See H 1430.
0130 UK, BBC London (as pac): Jazz Now and Then. See W 1130.
0130 UK, BBC London (south as): Breakfast Briefing. See S 0130.
0145 UK, BBC London (as pac): Good Books. See M 0030.
0145 UK, BBC London (south as): Global Concerns. See F 0145.

HAUSER'S HIGHLIGHTS
CANADA: RCI W-95

from Sackville only, as timeshifted 29 Oct to 31 March

0600-0629	Mon-Fri	6150, 9760
1300-1400	daily?	9635, 11955
1400-1459	Mon-Fri	9640, 11955
1400-1700	Sun	9640, 11955
1745-1759	Mon-Fri	11935, 15325, 17820
2100-2159	daily	5925, 9805, 11945, 13650, 13690, 15150, 17820
2200-2229	daily	9805, 11945, 13690
2300-2329	daily	5960, 6040, 9535, 9755, 11940
2330-2359	Sat/Sun	5960, 6040, 9535, 9755, 11940
2330-2459	Mon-Fri	5960, 9755
0000-0029	Tue-Sat	6040, 9535, 11940
0000-0059	Sun/Mon	5960, 9755
0200-0259	daily	5905, 6010, 9535, 9755, 11725
0300-0329	Tue-Sat	6010, 9755
0300-0359	Sun/Mon	6010, 9755

And note 5960 has Deutsche Welle English relay at 0100 (via Bill Westenhaver, Joe Hanlon)

FREQUENCIES

0200-0300	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15365pa	15415as	15510as	17715as
		17750as	17795pa	17860pa	
0200-0300 vl	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755am	11940am
		13670am			
0200-0300	Costa Rica, R Peace Intl	7385am	9400am	15050am	
0200-0205	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0200-0300	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB Quito	9745am	21455am		
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	6130na	7265as	7285as
		7355as	9515as	9615as	
0200-0230	Hungary, Radio Budapest	6000na	9835na	11910na	
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300	Lebanon, Wings of Hope	9960va			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0225	Moldova, R Moldova Intl	9540na			
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0200-0300	Russia, Voice of	9620na	11730na	11750na	11805na
		12050na	13645as	13665na	13790na
		15180na	15425na	15580as	
0200-0300	Slovakia, AWR	9465as			
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom,BBC London	5970sa	5975va	6135af	6175na
		6195eu	7325va	9410va	9590am
		9605as	9760as	9915sa	11955as
		15360as			
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	USA, VOA Washington DC	7115as	7205as	9635as	11705as
		11725as	15170as	15205as	17740as
		17820as			
0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	USA, WHRI Noblesville IN	5745am	7315am	17510am	
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WWCR Nashville TN	5065am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	5950na	6065na	9505na	9680na
		11740na			
0200-0230	Vietnam, Voice of	7250na	9840na	15010na	
0230-0300	Albania, R Tirana Intl	6145na	7160na		
0230-0300	Austria, R Austria Intl	9655na	9870ca	13730sa	
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Philippines, R Pilipinas	17760me	17865me	21580me	
0230-0300 mtwhf	Portugal, R Portugal Intl	6175sa	9570na		
0230-0300	Sweden, Radio	7120na			
0250-0300	Vatican State, Vatican R	7305na	9605na		

SELECTED PROGRAMS

Sundays

0230 UK, BBC London (af): The Ed Stewart Show. Ed plays the music of internationally known vocalists.

0230 UK, BBC London (am): Variable Music Feature. Different features of 15, 30, and 45 minutes length with a musical theme.

0230 UK, BBC London (as pac/eu): The Ed Stewart Show. See S 0230.

0230 UK, BBC London (south as): In Praise of God. Weekly programme of worship and meditation.

0250 Vatican State, Vatican Radio: With Heart and Mind. How this week's liturgical readings apply to our everyday lives.

0258 Vatican State, Vatican Radio: On-the-Air. A preview of upcoming programs and broadcast changes.

Mondays

0230 UK, BBC London (af/as pac/eu/south as): Composer of the Month. See S 0530.

0230 UK, BBC London (am): Meridian. See S 0630.

0250 Vatican State, Vatican Radio: Catholic Writers. Readings or books or dramatizations of stories by Catholic writers, past and present.

Tuesdays

0230 UK, BBC London (af/as pac/eu/south as): Variable Comedy/Quiz Feature. See S 1530.

0230 UK, BBC London (am): Discovery. In-depth look at scientific research.

0250 Vatican State, Vatican Radio: A Room with a View of the Vatican. The look at the activities of the Catholic Church in Rome.

Wednesdays

0230 UK, BBC London (af/as pac/eu/south as): Andy Kershaw's World of Music. See S 1230.

0230 UK, BBC London (am): Composer of the Month. See S 0530.

0250 Vatican State, Vatican Radio: The Rome Report. A behind the scenes review of issues currently confronting the church and the world.

Thursdays

0230 UK, BBC London (af/as pac/eu/south as): Sports International. Live commentaries and interviews, features and discussions.

0230 UK, BBC London (am): Meridian. See S 0630.

0250 Vatican State, Vatican Radio: Pilgrim City (biweekly). A look at whose been to Rome recently.

0250 Vatican State, Vatican Radio: The Pope and the People (biweekly). Recent public statements by the Pope and responses from the man on the street.

Fridays

0230 UK, BBC London (af/as pac/eu/south as): Stories in Verse. See T 1130.

0230 UK, BBC London (am): Focus on Faith. See F 0130.

0250 Vatican State, Vatican Radio: Then and Now. A look back at an event in history.

Saturdays

0230 UK, BBC London (af/as pac/eu/south as): People and Politics. See S 0130.

0230 UK, BBC London (am): Meridian. See S 0630.

0250 Vatican State, Vatican Radio: By the Way.... Putting a Catholic perspective on issues in the news.

0256 Vatican State, Vatican Radio: Roundtable Discussion. Conversation about today's religious questions.

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HAUSER'S HIGHLIGHTS
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2200-2300 5810, 9985

WYFR programs over VOFC for W-95:

English		
1302-1502	11550	275°
Hindi		
0000-0100	11550	275°
1502-1602	11550	275°
Mandarin		
1102-1602	5275	310°
	9280	335°
2100-2400	6300	310°
2100-2300	9280	335°
2200-2400	9465	300°
2300-2400	11550	335°
Russian		
1505-1705	9955	325°
(WYFR)		

10:00 PM EST
7:00 PM PST

SHORTWAVE GUIDE

0300 UTC

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15245as	15365pa	15510as	17750pa
		17795pa	17860pa		
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9710na	11715na	
0300-0400	Costa Rica, R Peace Intl	7385am	9400am		
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0305	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	21455am		
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na
		9650na			
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, NHK/Radio	5960na	9605na	11840as	17810as
0300-0330	Japan, NHK/Radio	11885na	11895ca	11960na	
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0330	Mongolia, R Ulan Bator	9960na	12000na		
0300-0325	Netherlands, Radio	5905as	7305as	9860as	11655as
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0330 m	Norway, Radio Norway Intl	6030na			
0300-0330	Philippines, R Pilipinas	17760me	17865me	21580me	
0300-0400	Russia, Voice of	9620na	9665na	11730na	12050na
		13605na	13645na	13665na	15180na
		15425na	15580na		
0300-0400	S Africa, Channel Africa	5995af	9585af		
0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
		15345as			
0300-0330	Thailand, Radio	9655na	11905na		
0300-0330	United Kingdom,BBC London	5970sa	6135af	7325va	9760as
		9915sa	15360as	15380as	
0300-0400	United Kingdom,BBC London	3255af	5975va	6005af	6175na
		6180eu	6190af	6195eu	9410va
		9600af	9605as	11760me	12095af
		15310as			
0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	USA, VOA Washington DC	5980af	6115af	7105af	7280af
		7340af	7405af	9575af	15300af
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	5745am	7315am	17510am	
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	5950na	6065na	9505na	9680na
0300-0315	Vatican State, Vatican R	7305na	9605na		
0300-0400	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
0315-0330 s	Greece, Voice of	7450na	9420na	9935na	
0320-0350	Vatican State, Vatican R	7360af	9660af		
0330-0357	Czech Rep, Radio Prague	9480as			
0330-0400	Hungary, Radio Budapest	6000na	9835na	11910na	
0330-0400	Sweden, Radio	7120na			
0330-0400 vl	Tanzania, Radio	5050af			
0330-0400	UAE, Radio Dubai	13675na	15395eu	21605na	
0330-0400	United Kingdom,BBC London	9610af	11730af	11955as	15280as
0340-0350	Greece, Voice of	7450na	9420na	9935na	
0345-0400 irreg	Burundi, Radio Nationale	6140do			

SELECTED PROGRAMS

Sundays

0305 UK, BBC London (am/as pac): World Business Review. A look back at the previous week's business and a preview of upcoming events.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. The latest sports news.
0330 UK, BBC London (af/am): From Our Own Correspondent (Alternative). See S 0130.
0330 UK, BBC London (as pac): Variable Feature. See S 0005.
0330 UK, BBC London (eu): Fourth Estate. John Eidinow and his team review the European press.
0330 UK, BBC London (south as): From Our Own Correspondent. See S 0130.
0335 UK, BBC London (af): Postmark Africa. Expert answers to any question under the sun.
0345 UK, BBC London (eu): Science View. A five-minute science program.
0350 UK, BBC London (af): Waveguide. The latest information on international broadcasting with reviews of receivers and news about reception.
0350 UK, BBC London (am): Variable Feature. See S 0005.
0350 UK, BBC London (eu): Waveguide. See S 0350.
0350 UK, BBC London (south as): Write On. See S 0145.

Mondays

0305 UK, BBC London (am/as pac): World Business Brief. See S 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af): Jazz for the Asking (Alternative). See S 0630.
0330 UK, BBC London (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.
0330 UK, BBC London (am): Musical Quiz Feature. NEW! Counterpoint. See A 1230.
0330 UK, BBC London (as pac): Off the Shelf. See M 0145.
0330 UK, BBC London (eu): Jazz for the Asking. See S 0630.
0330 UK, BBC London (south as): Anything Goes. See S 1215.
0345 UK, BBC London (as pac): BBC English (Speaking of English). See S 1530.

Tuesdays

0305 UK, BBC London (am/as pac): World Business Report. See M 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af): John Peel (Alternative). See S 0530.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am): The World Today. See M 1630.
0330 UK, BBC London (as pac): Off the Shelf. See M 0145.
0330 UK, BBC London (eu/south as): John Peel. See S 0530.
0345 UK, BBC London (am): Development '95. See M 0530.
0345 UK, BBC London (as pac): BBC English (Neighbors). See S 1530.

Wednesdays

0305 UK, BBC London (am/as pac): World Business Report. See M 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af/eu): Discovery (Alternative). See T 0230.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am): The World Today. See M 1630.
0330 UK, BBC London (as pac): Off the Shelf. See M 0145.
0330 UK, BBC London (eu): Europe Today. See M 0430.
0330 UK, BBC London (south as): Discovery. See T 0230.
0345 UK, BBC London (am): Media Feature. A Week on the Web. See T 0530.
0345 UK, BBC London (as pac): BBC English (Back to the Drawing Board). See S 1530.

Thursdays

0305 UK, BBC London (am/as pac): World Business Report. See M 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (af): Variable Feature (Alternative). See S 0005.
0330 UK, BBC London (am): The World Today. See M 1630.
0330 UK, BBC London (as pac): Off the Shelf. See M 0145.
0330 UK, BBC London (eu/south as): Assignment. See H 0130.
0345 UK, BBC London (am): Variable Feature (16th,23rd,30th). See S 0005.
0345 UK, BBC London (am): Western Philosophers in a Nutshell (2nd,9th). See M 0445.
0345 UK, BBC London (as pac): BBC English (Britain Now). See S 1530.

Fridays

0305 UK, BBC London (am/as pac): World Business Report. See M 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af): Focus on Faith (Alternative). See F 0130.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am): The World Today. See M 1630.
0330 UK, BBC London (as pac): Off the Shelf. See M 0145.
0330 UK, BBC London (eu/south as): Focus on Faith. See F 0130.
0345 UK, BBC London (am): Variable Feature. See S 0005.
0345 UK, BBC London (as pac): BBC English (Jigsaw). See S 1530.

Saturdays

0305 UK, BBC London (am/as pac): World Business Report. See M 1205.
0315 UK, BBC London (af/am/as pac/eu/south as): Sports Roundup. See S 0315.
0330 UK, BBC London (af): The Vintage Chart Show (Alternative). See W 1215.
0330 UK, BBC London (am): The World Today. See M 1630.
0330 UK, BBC London (as pac/eu/south): The Vintage Chart Show. See W 1215.
0331 UK, BBC London (af): African Quiz (4th). A monthly test of the listener's knowledge of Africa.
0331 UK, BBC London (af): This Week and Africa. A roundup of the week's political developments across the continent.
0345 UK, BBC London (am): Global Concerns. See F 0145.

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FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	15510pa	17715pa
		17750as	17795pa	17860pa	
0400-0500 vl	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9650me	11835me	11905me	15275me
0400-0500	China, China Radio Intl	9560na	9730na	11680na	
0400-0500	Costa Rica, R Peace Intl	7385am	9400am		
0400-0405	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0400-0500	Cuba, Radio Havana Cuba	6000na	6180na	9820na	9830na
0400-0500	Ecuador, HCJB Quito	9745am	21455am		
0400-0450	Germany, Deutsche Welle	6045na	6065af	7225af	
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia, Voice of	9620eu	9665na	12010na	12050na
		13665na	15180na	15425na	15580as
0400-0500	S Africa, Channel Africa	5995af	9585af		
0400-0427	S Africa, Trans World R	7165af			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	7190na	9560as	9685eu	
0400-0415	Uganda, Radio	4976do			
0400-0500	Ukraine, R Ukraine Intl	9685na	9835na	9860na	11875na
0400-0500	United Kingdom,BBC London	3255af	5975va	6005af	6180eu
		6190af	6195va	7160af	9410va
		9600af	9610af	11730af	11760me
		11955as	12095va	15280as	15310as
		15575me	17640af		
0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	3985va	5995va	6010va	6040va
		6873va	7170va	7200va	7280af
		7405af	9575af	11965va	15205va
		15300af			
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	5745am	7315am	17510am	
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	5065am	5935am	7435am	
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0500	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Australia,DefenseForces R	13525as			
0430-0500	Netherlands, Radio	5995na	6165na		
0430-0500	Swaziland, Trans World R	3200af	5055af	6070af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0445-0500	Tajikistan, Tajik Radio	7245as			
0455-0500	Nigeria, FRCN/Voice of	7255af			
0459-0500 mtwhf	New Zealand, R NZ Intl	11900pa			

SELECTED PROGRAMS

Sundays

0410 UK, BBC London (as pac): Spotlight. Focus on the theater.
0415 UK, BBC London (as pac): A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
0430 UK, BBC London (af): Short Story (Alternative). Fifteen-minute dramas written by listeners from around the world.
0430 UK, BBC London (am): Science in Action. The latest in science and technology.
0430 UK, BBC London (eu/south as): Short Story. See S 0430.
0435 UK, BBC London (af): The Art House. No information available.
0445 UK, BBC London (eu/south as): Popular Music Feature. Local Heroes (5th). A look at musical superstars that are known only in certain parts of the world.
0445 UK, BBC London (eu/south as): Variable Feature (12th,19th,26th). See S 0005.

Mondays

0410 UK, BBC London (as pac): Take Five. A short series of human interest stories.
0415 UK, BBC London (as pac): The Learning World. See S 0030.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (af): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (am): The Learning World. See S 0030.
0430 UK, BBC London (as pac): John Peel. See S 0530.
0430 UK, BBC London (eu): Europe Today. All the latest news, analysis and comment.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (south as): The Secret Life of a Song. See H 0545.
0445 UK, BBC London (am): Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.
0445 UK, BBC London (eu): Variable Feature (Alternative) (18th,25th). See S 0005.
0445 UK, BBC London (eu/south as): Western Philosophers in a Nutshell (Alternative) (4th,11th). David Edmonds talks to eminent philosophers about the great thinkers of the past.
0445 UK, BBC London (south as): Variable Feature (18th,25th). See S 0005.

Tuesdays

0410 UK, BBC London (as pac): Pop Short. A five-minute popular music program.
0415 UK, BBC London (as pac): The World Today. See M 1630.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (af/eu): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (am): Outlook. See M 1405.
0430 UK, BBC London (as pac): Variable Feature. See S 0005.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (south as): Development '95. See M 0530.
0445 UK, BBC London (af): On Screen (Alternative). See S 1230.
0445 UK, BBC London (as pac/south as): On Screen. See S 1230.
0445 UK, BBC London (eu): Variable Feature (Alternative). See S 0005.
0455 UK, BBC London (am): Press Review. See S 0110.

Wednesdays

0410 UK, BBC London (as pac): Variable Feature. See S 0005.
0415 UK, BBC London (as pac): The World Today. See M 1630.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (af/eu): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (am): Outlook. See M 1405.
0430 UK, BBC London (as pac): Musical Quiz Feature. NEW! Counterpoint. See A 1230.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (south as): Off the Shelf. See M 0145.
0445 UK, BBC London (af/eu): Country Style (Alternative). See S 1445.
0445 UK, BBC London (south as): Country Style. See S 1445.
0455 UK, BBC London (am): Press Review. See S 0110.

Thursdays

0410 UK, BBC London (as pac): Take Five. See M 0410.
0415 UK, BBC London (as pac): The World Today. See M 1630.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (af/eu): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (am): Outlook. See M 1405.
0430 UK, BBC London (as pac): Megamix. See T 1615.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (south as): Media Feature. A Week on the Web. See T 0530.
0445 UK, BBC London (af/eu): From Our Own Correspondent (Alternative). See S 0130.
0445 UK, BBC London (south as): From Our Own Correspondent. See S 0130.
0455 UK, BBC London (am): Press Review. See S 0110.

Fridays

0410 UK, BBC London (as pac): Variable Feature. See S 0005.
0415 UK, BBC London (as pac): The World Today. See M 1630.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (af/eu): Off the Shelf (Alternative). See M 0145.
0430 UK, BBC London (am): Outlook. See M 1405.
0430 UK, BBC London (as pac): Waveguide. See S 0350.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (south as): Folk Routes. See T 0030.
0440 UK, BBC London (as pac): Book Choice. See S 1525.
0445 UK, BBC London (af/eu): Folk Routes (Alternative). See T 0030.
0445 UK, BBC London (as pac): Folk Routes. See T 0030.
0445 UK, BBC London (south as): The Farming World. See M 0015.
0455 UK, BBC London (am): Press Review. See S 0110.

Saturdays

0410 UK, BBC London (as pac): BBC English (Voice Box). See S 1530.
0415 UK, BBC London (as pac): The World Today. See M 1630.
0430 UK, BBC London (af): Jazz Now and Then (Alternative). See W 1130.
0430 UK, BBC London (am): Outlook. See M 1405.
0430 UK, BBC London (as pac): Science in Action. See S 0430.
0430 UK, BBC London (eu/south as): Jazz Now and Then. See W 1130.
0431 UK, BBC London (af): Talkabout Africa. See W 1615.
0445 UK, BBC London (eu/south as): Seven Days. See A 0030.
0455 UK, BBC London (am): Press Review. See S 0110.

AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

• SPECIFICATIONS •

- **Range:** .5 - 1900MHz usable to 100kHz
- **Modes:** AM/NFM/WFM/USB/LSB/CW
- **Stepsize:** 50Mz to 999.995kHz
- **Sensitivity(µV):** 30 to 1000MHz
  SSB .2 **AM** 1.0 **NFM** .35 **WFM** 1.0
- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12
  WFM 180
- **Memories:** 50 ch. x 20 banks=1000 total
- **Size/Wt.:** 6.1 x 2.8 x 1.6 inch.
  20 oz. batt. incl.

* Cell blocked for all, but Approved agencies.

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- **Covers .5-1900MHz***
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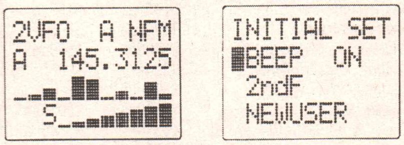
- **4 level alpha numeric LCD read out frequency, mode, signal strength, band scope spectral display, battery low, remote and more**
- **Computer control up/down load data, will add a new dimension to the world of scanning.**
- **Clone your memory banks with a friend, load 1000 memory channels in seconds**

.1 - 1900MHz*



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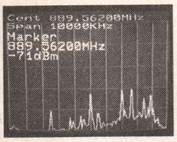
SDU 5000

NEW

The Spectral Display Unit adds a new dimension to the signal interception hobby. Imagine seeing stations above and below your receiving frequency. Usually the transmissions are short, perhaps 1 or 2 seconds. What are the chances of you being tuned to the exact frequency at the instant of transmission? Very slim. With an SDU you can watch for stations to pop up over a 10MHz window, then zero in. The SDU 5000 offers features unheard of only a year ago.

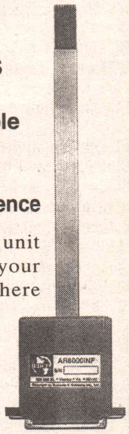


Δ Frequency coverage up to 10MHz Δ **Display -** 3.1" HQM Simple matrix color LCD Δ **Resolution:** 5 or 30kHz selectable Δ **Input:** 10.7MHz Δ 50dB Dynamic range Δ Screen refresh 2/s Δ Composite video out Δ Full computer control Δ Video output NTSC or Pal display, on TV or record on VCRΔ RS232 9600bps Δ Instant receiver set from cursor via RS232 Δ Store image on disc or your video recorder Δ Menu driven system makes SDU5000 simple to operate Δ SDU5000 is designed to work with the AR3000A (modified with a 10.7MHz output) using RS232 link with or without a computer. Other receivers with 10.7MHz IF output but digital linking may not be straight forward.

AR8000 Interface

Computer Interface for the AR8000

- **Δ Low Power, powered by your serial port**
- **Δ No Drain on the batteries in the radio**
- **Δ Light weight, perfect for Laptop use**
- **Δ As small as a DB-25 Connector**
- **Δ Hi-Tech Surface mount design for reliability**
- **Δ 100% Shielded cable to receiver for reduced interference**
- **Δ PC Software included for Windows and DOS**
- **Δ Manual included**
- **Δ Detailed Programers documentation available**
- **Δ Designed and Manufactured in the USA**
- **Δ Optional 100% shield computer cable from AR8000INF to computer for reduced interference**



Unlike some of the European devices sold today, this unit is smaller, lighter, and makes no power demands on your receiver. With the extra shielding and smaller size there is less chance of additional interference leaking into your radio. The AR8000INF is also the only interface that is upgradeable for use with the optional Tape recorder controller due first quarter '95.

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0500 UTC SHORTWAVE GUIDE 12:00 PM EST 9:00 PM PST

FREQUENCIES

0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15245as	15365pa	15415as	17715pa
		17795pa	17860pa		
0500-0600	Australia,DefenseForces R	13525as			
0500-0600	Bulgaria, Radio	9700na	11720na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	7295eu	15430af	17840af
0500-0600	Costa Rica, R Peace Intl	7385am	9400am		
0500-0505	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0500-0600	Cuba, Radio Havana Cuba	9820na	9830na		
0500-0600	Ecuador, HCJB Quito	9745am	21455am		
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6185na
0500-0515	Israel, Kol Israel	5895na	17545na		
0500-0600	Japan, NHK/Radio	5975eu	6110na	6150eu	9605na
		11725as	11740as	11885na	17810as
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600	Lebanon, Wings of Hope	9960va			
0500-0525	Netherlands, Radio	5995na	6165na		
0500-0600 mtwhf	New Zealand, R NZ Intl	11900pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0600	Russia, AWR	9895me			
0500-0600	Russia, Voice of	12010na	12030na	12040na	12050na
		13370as	13645na	13665na	15425na
		15580na			
0500-0600	S Africa, Channel Africa	7185af	11900af		
0500-0600	Slovakia, AWR	9455af	13715me		
0500-0600	Spain, R Exterior Espana	9540na			
0500-0600	United Kingdom,BBC London	3255af	5975va	6005af	6180eu
		6190af	6195va	7160af	9410va
		9600af	9640va	9740as	11760af
		11955as	12095va	15070me	15280as
		15310va	15360as	15420af	15575me
		17640af	17885af		
0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, VOA Washington DC	3985va	5995va	6035af	6040va
		6140va	6873va	7170va	7200va
		7405af	9630af	11965va	12080af
		15205va			
0500-0600	USA, WHRI Noblesville IN	5745am	7315am	9930am	
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5065am	5935am	7435am	
0500-0530	Vatican State, Vatican R	9660af	11625af	13765af	
0500-0600	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0505-0600	Swaziland, Trans World R	3200af	5055af	6070af	9500af
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Australia, Radio	15510as	15565as	17880as	
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Romania, R Romania Intl	11810af	15250af	15340af	17745af
		17790af			
0530-0557	Yugoslavia, Radio	9580na	11870na		

SELECTED PROGRAMS

Sundays

0505 UK, BBC London (south as): Spotlight. See S 0410.
0510 UK, BBC London (south as): Variable Feature. See S 0005.
0530 UK, BBC London (af): In Praise of God (Alternative). See S 0230.
0530 UK, BBC London (am): John Peel. Tracks from newly released albums and singles from the contemporary music scene.
0530 UK, BBC London (as pac): Composer of the Month. In depth looks at classical composers and their music. A different composer is featured each month.
0530 UK, BBC London (eu): In Praise of God. See S 0230.
0535 UK, BBC London (af): Postmark Africa. See S 0335.
0555 UK, BBC London (south as): Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.

Mondays

0505 UK, BBC London (south as): Take Five. See M 0410.
0510 UK, BBC London (south as): The Ed Stewart Show. See S 0230.
0530 UK, BBC London (af): Anything Goes (Alternative). See S 1215.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): Variable Feature. See S 0005.
0530 UK, BBC London (as pac): Development '95. Aid and development issues.
0530 UK, BBC London (eu): Andy Kershaw's World of Music. See S 1230.
0540 UK, BBC London (south as): On the Move. See S 0615.
0545 UK, BBC London (as pac): Short Story. See S 0430.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

Tuesdays

0505 UK, BBC London (south as): BBC English (Voice Box). See S 1530.
0510 UK, BBC London (south as): A Jolly Good Show. See S 0415.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): Multitrack Hit List. See M 1615.
0530 UK, BBC London (as pac): Discovery. See T 0230.
0530 UK, BBC London (eu): Media Feature. A Week on the Web (7th,14th,21st). A topical roundup of the week's activity on the Internet is hosted by a different presenter each week.
0530 UK, BBC London (eu): Variable Feature (28th). See S 0005.
0545 UK, BBC London (af): On the Move (Alternative). See S 0615.
0545 UK, BBC London (eu): On the Move. See S 0615.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

Wednesdays

0505 UK, BBC London (south as): Take Five. See M 0410.
0510 UK, BBC London (south as): Concert Hall. See S 1415.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (af): Omnibus (Alternative). See M 1130.
0530 UK, BBC London (am): Megamix. See T 1615.
0530 UK, BBC London (as pac/eu): Omnibus. See M 1130.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

Thursdays

0505 UK, BBC London (south as): Pop Short. See T 0410.
0510 UK, BBC London (south as): The Greenfield Collection. See T 1515.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (af): The Learning World (Alternative). See S 0030.
0530 UK, BBC London (am): Multitrack X-Press. See W 1615.
0530 UK, BBC London (as pac): Assignment. See H 0130.
0530 UK, BBC London (eu): The Learning World. See S 0030.
0545 UK, BBC London (eu): The Secret Life of a Song. How famous melodies appear time and again.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

Fridays

0505 UK, BBC London (south as): Variable Feature. See S 0005.
0510 UK, BBC London (south as): Variable Feature. See S 0005.
0530 UK, BBC London (af): Andy Kershaw's World of Music (Alternative). See S 1230.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): Andy Kershaw's World of Music. See S 1230.
0530 UK, BBC London (as pac): Focus on Faith. See F 0130.
0530 UK, BBC London (eu): Variable Comedy/Quiz Feature. See S 1530.
0540 UK, BBC London (south as): Variable Feature. See S 0005.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

Saturdays

0505 UK, BBC London (south as): Variable Feature. See S 0005.
0510 UK, BBC London (south as): Music Review. See S 1415.
0530 UK, BBC London (af): The Ed Stewart Show (Alternative). See S 0230.
0530 UK, BBC London (am): Multitrack Alternative. See F 1330.
0530 UK, BBC London (as pac): Anything Goes. See S 1215.
0530 UK, BBC London (eu): Science in Action. See S 0430.
0531 UK, BBC London (af): African Quiz (4th). See A 0331.
0531 UK, BBC London (af): This Week and Africa. See A 0331.
0555 UK, BBC London (south as): Words of Faith. See S 0555.

HAUSER'S HIGHLIGHTS
BELGIUM: R VLAANDEREN INT'L ENGLISH FOR W95:

	0730-0800	5985, 9925
	1000-1030 (exc Sun)	6025, 15510, 17595
NAm	1400-1430 (Sun 1330-1400)	13670
	1900-1930	5910, 9925
	2200-2230	5910, 7250
NAm	0030-0100	6030
SAm	0030-0100	9925

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FREQUENCIES

0600-0700	Australia, Radio	11910pa	13605as	13755pa	15240pa
		15365pa	15510as	17715as	17795pa
0600-0630	Australia, Radio	9580pa	9660pa	15415pa	
0600-0630	Australia,DefenseForces R	13525as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, R Peace Intl	7385am	9400am		
0600-0605	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0600-0700	Cuba, Radio Havana Cuba	9820na	9830na		
0600-0700	Ecuador, HCJB Quito	9745am	21455am		
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	6100af	9565af	11765af	13790af
		15185af	17820af	21705me	
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 mtwh/vl	Italy, IRRS Milan	7125va			
0600-0700	Japan, NHK/Radio	17810as			
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700	Lebanon, Wings of Hope	9960va			
0600-0700 vl	Liberia, Radio ELBC	7275do			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 mtwhfa	Malta, V of Mediterranean	9765me			
0600-0635 s	Malta, V of Mediterranean	9765me			
0600-0700 mtwhf	New Zealand, R NZ Intl	11900pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0700	North Korea, R Pyongyang	15180as	15230as		
0600-0700	Russia, Voice of	12010na	12030na	12040na	12050na
		13370as	13645na	13665na	15425na
		15560as	15580as	17570as	
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	7205na	11945na		
0600-0615	Switzerland, Swiss R Intl	6165eu	9535eu		
0600-0700	United Kingdom,BBC London	6005af	6180eu	6190af	6195va
		7160af	9410va	9600af	9640va
		9740as	11760me	11940af	11955as
		12095va	15070va	15280as	15310as
		15360va	15400af	15420af	15575va
	17640af	17790as	17885af		
0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, VOA Washington DC	3985va	5995va	6035af	6040va
		6060va	6140va	6873va	7170va
		7325va	7405af	9630af	11805va
		11950af	11965va	12035af	12080af
		15205va			
0600-0700	USA, WEWN Birmingham AL	7425na			
0600-0700	USA, WHRI Noblesville IN	5745am	7315am	9930am	
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5065am	5935am	7435am	
0600-0620	Vatican State, Vatican R	4005eu	5860eu		
0600-0700 irreg	Yemen, Yemeni Rep Radio	9780as			
0600-0700	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0605-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0630-0700	Australia, Radio	5995pa	6020pa	6080pa	9860pa
		15245as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Georgia, Georgian Radio	11805eu			
0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0631-0640	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0615 UK, BBC London (af/as pac/eu/south as): Letter from America. See S 0030.
0615 UK, BBC London (am): On the Move. A weekly program about travel and transport with Malcolm Billings.
0630 UK, BBC London (af): Jazz for the Asking (Alternative). Record requests with Malcolm Laylock.
0630 UK, BBC London (am): Meridian. Three topical programmes weekly about the world of the arts.
0630 UK, BBC London (as pac/south as): From Hoplite to Harrier. See M 0630.
0630 UK, BBC London (eu): Jazz for the Asking. See S 0630.
0631 UK, BBC London (af): African Perspective. A considered view of life and issues facing the African continent.

Mondays

0615 UK, BBC London (af): Network Africa. See M 0330.
0615 UK, BBC London (am): Concert Hall. See S 1415.
0615 UK, BBC London (as pac): Country Style. See S 1445.
0615 UK, BBC London (south as): The Learning World. See S 0030.
0630 UK, BBC London (as pac/south as): Jazz for the Asking. See S 0630.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): From Hoplite to Harrier (Alternative). A series tracing the history of warfare from ancient Greece to today's high-tech world.

Tuesdays

0615 UK, BBC London (af): Network Africa. See M 0330.
0615 UK, BBC London (af): The World Today (Alternative). See M 1630.
0615 UK, BBC London (am): The Secret Life of a Song. See H 0545.
0615 UK, BBC London (as pac): Health Matters. See M 0445.
0615 UK, BBC London (eu): Europe Today. See M 0430.
0615 UK, BBC London (south as): The World Today. See M 1630.
0630 UK, BBC London (am): From Hoplite to Harrier. See M 0630.
0630 UK, BBC London (as pac/eu/south as): Popular Music Feature. Bhangra Beat with DJ Ritu (7th,14th). Introducing exciting new pop music originally from India.
0630 UK, BBC London (as pac/eu/south as): Variable Music Feature (21st,28th). See S 0230.

Wednesdays

0615 UK, BBC London (af): Network Africa. See M 0330.
0615 UK, BBC London (af): The World Today (Alternative). See M 1630.
0615 UK, BBC London (am): Variable Feature. See S 0005.
0615 UK, BBC London (as pac): Media Feature. A Week on the Web. See T 0530.
0615 UK, BBC London (south as): The World Today. See M 1630.
0630 UK, BBC London (af): Megamix (Alternative). See T 1615.
0630 UK, BBC London (am/as pac/south as): Meridian. See S 0630.
0630 UK, BBC London (eu): Megamix. See T 1615.

Thursdays

0615 UK, BBC London (af): Network Africa. See M 0330.
0615 UK, BBC London (am): A Jolly Good Show. See S 0415.
0615 UK, BBC London (as pac): Variable Feature (16th,23rd,30th). See S 0005.
0615 UK, BBC London (as pac): Western Philosophers in a Nutshell (2nd,9th). See M 0445.
0615 UK, BBC London (south as): The World Today. See M 1630.
0630 UK, BBC London (af): Sports International (Alternative). See H 0230.
0630 UK, BBC London (af): The World Today (Alternative). See M 1630.
0630 UK, BBC London (as pac/eu/south as): Sports International. See H 0230.
0630 UK, BBC London (eu): Europe Today. See M 0430.

Fridays

0615 UK, BBC London (af): Network Africa. See M 0330.
0615 UK, BBC London (af): The World Today (Alternative). See M 1630.
0615 UK, BBC London (am): Country Style. See S 1445.
0615 UK, BBC London (as pac): On the Move. See S 0615.
0615 UK, BBC London (south as): The World Today. See M 1630.
0630 UK, BBC London (am/as pac/south as): Meridian. See S 0630.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): The Ed Stewart Show (Alternative). See S 0230.

Saturdays

0615 UK, BBC London (af): Seven Days. See A 0030.
0615 UK, BBC London (af): The World Today (Alternative). See M 1630.
0615 UK, BBC London (am/as pac): From the Weeklies. See A 0030.
0615 UK, BBC London (eu): Fourth Estate. See S 0330.
0615 UK, BBC London (south as): The World Today. See M 1630.
0630 UK, BBC London (af): Focus on Faith (Alternative). See F 0130.
0630 UK, BBC London (am): People and Politics. See S 0130.
0630 UK, BBC London (as pac/south as): Meridian. See S 0630.
0631 UK, BBC London (af): African Quiz (4th). See A 0331.
0631 UK, BBC London (af): This Week and Africa. See A 0331.
0645 UK, BBC London (eu): On Screen. See S 1230.

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FREQUENCIES

0700-0800	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	15240pa	15565as
		17695as			
0700-0730	Australia, Radio	13605as	15415as	17795as	
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7385am	9400am		
0700-0727	Czech Rep, Radio Prague	7345eu	15640eu		
0700-0800	Ecuador, HCJB Quito	5900pa	11615as	21455am	
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 mtwh/vl	Italy, IRRS Milan	7125va			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740as	11850pa
		15165me	17815af	21610as	
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Lebanon, Wings of Hope	9960va			
0700-0800 vl	Liberia, Radio ELBC	7275do			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0716 mtwhf	New Zealand, R NZ Intl	11900pa			
0700-0757 as	New Zealand, R NZ Intl	11900pa			
0700-0750	North Korea, R Pyongyang	15340af	17765me		
0700-0730 m	Norway, Radio Norway Intl	7180pa			
0700-0800	Russia, Voice of	13370as	15560as	17570as	17590as
		17695as	17870as		
0700-0800	Slovakia, AWR	7215eu	13715af		
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0730	Switzerland, Swiss R Intl	6165eu	9535af	9885af	13635af
		15340af			
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom,BBC London	6190af	9410va	9600af	9640va
		9740as	11760me	11940af	11955as
		12095va	15070va	15280as	15360va
		15400va	15575me	17640af	17790as
		17830af	17885af		
0700-0730	United Kingdom,BBC London	6005af	6180eu	6195eu	
0700-0715	United Kingdom,BBC London	7160af	11860af		
0700-0800	USA, KAIJ Dallas TX	5810am			
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17780as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	7425na			
0700-0800	USA, WHRI Noblesville IN	5745am	7315am	9930am	
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am	
0700-0800	USA, WYFR Okeechobee FL	5950na			
0700-0745 mtwhf	Vatican State, Vatican R	4005va	5860va		
0700-0800	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0705-0800	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0717-0800	New Zealand, R NZ Intl	9700pa			
0730-0800	Australia, Radio	9660pa	17880as		
0730-0800	Austria, R Austria Intl	6155eu	13730eu		
0730-0800	Belgium, R Vlaanderen Int	5985eu	9925au		
0730-0745 s	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0800	Netherlands, Radio	9720au	11895pa		
0740-0800	Monaco, Trans World Radio	7115eu			
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0755	Greece, Voice of	9425eu	11645eu	15650eu	
0745-0800	USA, WRMI/R Miami Intl	9955am			
0755-0800	Guam, AWR/KTWR	15200as			

0800 UTC

0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	17715as	21725as
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Australia,DefenseForces R	15607af	18194af		
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	9400am			
0800-0830	Ecuador, HCJB Quito	5900pa	11615eu	21455am	
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0830	Georgia, Georgian Radio	11910eu			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900 mtwh/vl	Italy, IRRS Milan	7125va			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900	Lebanon, Wings of Hope	9960va			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	15295as			
0800-0900	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9720au	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do		
0800-0900	Russia, Voice of	9835as	11800as	11900as	13370as
		15560as	17590as	17695as	17765as
		17870as			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670me		
0800-0900	United Kingdom,BBC London	6190af	9410va	9740as	11760me
		11940af	11955as	12095va	15070va
		15280as	15310as	15400va	15575me
		17640va	17830af	17885af	
0800-0815	United Kingdom,BBC London	9640va			
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0900	USA, KNLS Anchor Point AK	6150as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu	13615pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	7425na			
0800-0900	USA, WHRI Noblesville IN	5745am	7315am	9930am	
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WRMI/R Miami Intl	9955am			
0800-0900	USA, WWCR Nashville TN	5065am	5935am	7435am	
0800-0900	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0805-0835	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0830-0900 s	Armenia, Voice of	15170eu	15270eu		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	17870pa	
0830-0900	Netherlands, Radio	9720au	11895pa	13700pa	
0830-0857	Slovakia, R Slovakia Intl	11990au	15640au	17485au	
0855-0900	Guam, TWR/KTWR	11830pa			

HAUSER'S HIGHLIGHTS
MYANMAR [& NON]:

Democratic Voice of Burma, via Norway, dropped 0030 program and extended 1430 to 1515, on 11850, immediately following **BBC** Burmese on same at 1345-1430 //7135, 9725; BBC 11850 seems jammed, also at 0000-0030 (BBCM) BBC later confirmed the jamming of this service for the first time, and condemned it (Reuter via Dave Alpert) Though only one of the three Singapore frequencies at 1345 was jammed, another was added from Rampisham, UK, 17790; at 0000-0030 added 9670 from Cyprus, also on 9600 & 15380 Singapore; another broadcast is Sat & Sun only at 0245-0300 on Singapore 11850, 15380. Only other BBC service jammed is Standard Chinese (BBCM)

VOA also condemned jamming of its Burmese broadcasts as contrary to the Universal Declaration of Human Rights, and it is also done by North Korea, Cuba, China (VOA via Ed Rausch, NJ) Warble jamming was heard on 11840 at 1201, 7215 at 1229, but seemed to have stopped. Full VOA Burmese schedule, all via Philippines was: 1130-1230 on 6030, 9505, 11840, 13685; 2330-2400 on 5965, 6185, 7260 (Kim Elliott, VOA *Communications World*)

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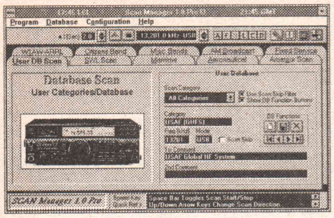
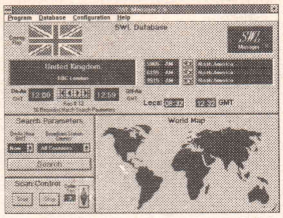


Scan Manager 1.0 Pro



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- Use Comm Ports 1-4
- Local & GMT Time Displayed on Screen
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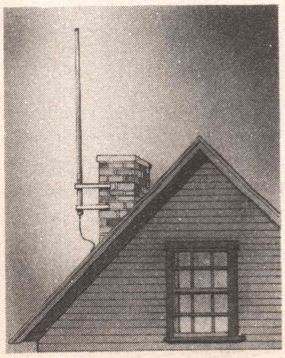

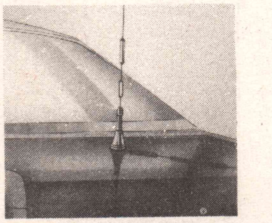

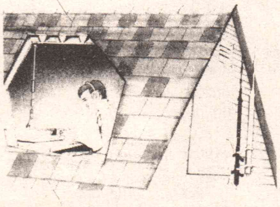

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FREQUENCIES

0900-1000	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	15170as	21725as
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Australia,DefenseForces R	15607af	18194af		
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa		
0900-1000	Costa Rica, R Peace Intl	7395am	9400am		
0900-1000	Ecuador, HCJB Quito	5900pa	21455am		
0900-0950	Germany, Deutsche Welle	6160pa	7380as	11715as	11725af
		15145af	17780pa	17820as	21600af
		21680as			
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-1000	Guam, AWR/KSDA	9530as			
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000	Japan, NHK/Radio	6090as	11850pa	15190as	
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	6280me			
0900-1000	Lebanon, Wings of Hope	9960va			
0900-1000	Malaysia, Radio	7295do			
0900-0905 a	Monaco, Trans World Radio	7115eu			
0900-0930	Netherlands, Radio	9720au	13700pa		
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9835as	11800as	11900as	17590as
		17695as	17765as	17870as	
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195as	9740as	11750as
		11940af	12095va	15070va	15190sa
		15280va	15400va	15575me	17640va
		17705va	17830va	17885af	
0900-0915	United Kingdom,BBC London	9575as	11765as	11955as	15310as
		15360as			
0900-0930	United Kingdom,BBC London	9410me	11760me		
0900-1000	USA, KAIJ Dallas TX	5810am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13615au
0900-1000	USA, WEWN Birmingham AL	7425na			
0900-1000	USA, WHRI Noblesville IN	5745am	7315am	9930am	
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WRMI/R Miami Intl	9955am			
0900-1000	USA, WWCR Nashville TN	5065am	5935am	7435am	
0900-1000	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0905-0920 smtwhf	Monaco, Trans World Radio	7115eu			
0910-0940	Mongolia, R Ulan Bator	9960au	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720au	9810pa	11895pa
		13700pa			
0930-1000	Philippines, FEBC/R Intl	11635as			

1000 UTC

1000-1100	Australia, Radio	5995as	7240as	9580pa	9860pa
		13605as	15170as	21725as	
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Australia,DefenseForces R	8743af	10621af	13525as	
1000-1025 mtwhfa	Belgium, R Vlaanderen Int	6025eu	15510af	17595af	
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica, R Peace Intl	9400am			
1000-1100	Ecuador, HCJB Quito	5900pa	21455am		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100	Lebanon, Voice of Hope	6280me			
1000-1100	Lebanon, Wings of Hope	9960va			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1100	Netherlands, Radio	7260as	9810pa		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia, Voice of	9835as	11800eu	11900as	13370as
		15110as	15405as	15510eu	17560as
		17590as	17765as	17870as	
1000-1100	Singapore, SBC Radio One	6155do			
1000-1100	Slovakia, AWR	15620am			
1000-1100	United Kingdom,BBC London	6190af	6195as	9410va	9740as
		11750as	11760me	11940af	12095va
		15070va	15190sa	15310as	15400eu
		15575me	17640va	17705va	17790as
		17885af			
1000-1030	United Kingdom,BBC London	15280as	17830as		
1000-1100	USA, KAIJ Dallas TX	5810am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13625as
1000-1100	USA, VOA Washington DC	5985va	6165am	7405am	9590am
		11720va	15425va		
1000-1100	USA, WHRI Noblesville IN	6040am	6185am	9930am	
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	5935am	7435am	
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	7250na	9840as	12020as	15010as
1030-1100 mtwhfa	Austria, R Austria Intl	6155eu	13730pa	17870pa	
1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me

Birth Announcement

NEW SOLAR CYCLE MAY HAVE BEGUN

By Jacques d'Avignon,

For the past months, the ionospheric propagation conditions have been dismal for SWL and ham operations; some hard core listeners have even been tempted to find another hobby. The scientific community had been forecasting that a new cycle would start around mid-1996.

Well! On August 12, the astronomers from Caltech at the Big Bear Solar Observatory saw the first indication of the new cycle: the first sunspot having a reverse polarity from the sunspots left over from the present cycle! This does not mean that listening or operating conditions will improve dramatically in the next few days or months, but it does hail the birth of the new cycle. The Caltech astronomers stated that the appearance of this new sunspot was unexpected; it was not supposed to happen so early!

According to the same astronomers, at the start of a new cycle, the sunspots appear in areas close to 30 degrees of the sun's latitude and as the cycle progresses the position of the spots slowly migrates nearer to sun's equator. The spot discovered on August 12, was near 21 degrees of latitude and was of opposite polarity to the sunspots remaining from the old cycle.

What can be expected? And how soon will the listening and ham operating conditions improve significantly? Some scientists are already talking of a very active new cycle and projecting that, by 1998/1999, we could see some high activity.

A very active cycle leads not only to superb listening conditions, but also to some severe disruptions of HF communications. You can be sure that electric utility engineers will keep their fingers crossed that a repeat of the major electrical power grid disruptions caused by sun storms in the late 1980's will not occur too frequently during this new cycle. Such major power grids disruptions have been directly related to major sun flares.

As the cycle progresses, we will see much higher MUF (Maximum Usable Frequency) on most circuits, but it will be some time before we reach the values that we had in the mid-1980's. Stay tuned, and good DX!

6:00 AM EST
3:00 AM PST SHORTWAVE GUIDE 1100 UTC

FREQUENCIES

1100-1200	Australia, Radio	5995as	7240as	9510pa	9580pa
		9710pa	9860pa	13605as	15170as
		15530as	15565as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Australia,DefenseForces R	13525as			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am
1100-1200	Costa Rica, R Peace Intl	9400am			
1100-1130	Ecuador, HCJB Quito	5900pa			
1100-1200	Ecuador, HCJB Quito	12005am	15115am	21455am	
1100-1150	Germany, Deutsche Welle	17765af			
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1200	Japan, NHK/Radio	6090as	6120na	15350as	
1100-1200	Lebanon, Voice of Hope	6280me			
1100-1200	Lebanon, Wings of Hope	9960va			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1200	Nepal, Radio	5005do	7165do		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Voice of	4740as	9835as	11900as	11940as
		13370as	15110as	15405as	15510eu
		17560as	17590as	17675as	17685as
		17755as	17765as	17775as	17795as
		17835as	17870as		
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	13635as	15545as
		17515as			
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	United Kingdom,BBC London	5965na	6190af	6195va	9410va
		9515na	9575as	9740va	11750as
		11760me	11765as	11940af	11955as
		12095va	15070va	15310as	15360as
		15575me	17640va	17705af	17830af
1100-1130	United Kingdom,BBC London	6100au	15190sa	15400eu	17790va
1100-1200	USA, KAIJ Dallas TX	5810am			
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395ca	9355as	9425au
1100-1200	USA, VOA Washington DC	5985va	6110va	6165am	7405am
		9590am	9645va	9760va	11720va
		15160va	15425va		
1100-1200	USA, WEWN Birmingham AL	7425na			
1100-1200	USA, WHRI Noblesville IN	6040am	6185am	9930am	
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 s	USA, WVHA Greenbush ME	13770af			
1100-1200	USA, WWCR Nashville TN	5935am	7435am	15685am	
1100-1200	USA, WYFR Okeechobee FL	5950na			
1100-1130	Vietnam, Voice of	7250as	9840as	15010as	
1130-1200	Austria, R Austria Intl	13730na			
1130-1200 vl	China, China Radio Intl	6995as	11445as	15135as	
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu		
1130-1200	Iran, VOIRI Tehran	11745as	11790as	11875me	11930me
		15260af	17750me		
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7190eu		
1130-1200	South Korea, R Korea Intl	11715na			
1145-1200	USA, WRMI/R Miami Intl	9955am			

SELECTED PROGRAMS

Sundays

1130 UK, BBC London (af): Play of the Week. A different radio drama program each week.
1130 UK, BBC London (am): In Praise of God. See S 0230.
1130 UK, BBC London (as pac): Play of the Week. See S 1130.
1130 UK, BBC London (eu): Jazz for the Asking. See S 0630.
1130 UK, BBC London (south as): The Ed Stewart Show. See S 0230.

Mondays

1105 UK, BBC London (am): Caribbean Report (Alternative). Weekday coverage of current affairs in the Caribbean region with emphasis on political and economic analysis.
1130 UK, BBC London (af): Meridian. See S 0630.
1130 UK, BBC London (am/as pac): Variable Comedy/Quiz Feature. See S 1530.
1130 UK, BBC London (eu): Omnibus. Each week a half-hour programme on practically any topic under the sun.
1130 UK, BBC London (south as): Composer of the Month. See S 0530.

Tuesdays

1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 UK, BBC London (af/am/as pac/eu/south as): Stories in Verse. Readings of some of the epics of poetry by some of Britain's finest actors.

Wednesdays

1100 UK, BBC London (south as): Omnibus. See M 1130.
1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 UK, BBC London (af/as pac/eu/south as): Meridian. See S 0630.
1130 UK, BBC London (am): Jazz Now and Then. Sarah Ward presents a mixture of jazz for all ages.
1145 UK, BBC London (am): Variable Feature. See S 0005.

Thursdays

1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 UK, BBC London (af): Variable Music Feature. See S 0230.
1130 UK, BBC London (am): From Our Own Correspondent. See S 0130.
1130 UK, BBC London (as pac): From Hoplite to Harrier. See M 0630.
1130 UK, BBC London (eu): Popular Music Feature. Bhangra Beat with DJ Ritu (2nd,9th,16th). See T 0630.
1130 UK, BBC London (eu/south as): Variable Feature (23rd,30th). See S 0005.
1145 UK, BBC London (am): The Learning World. See S 0030.

Fridays

1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 UK, BBC London (af/as pac/eu/south as): Meridian. See S 0630.
1130 UK, BBC London (am): Focus on Faith. See F 0130.

Saturdays

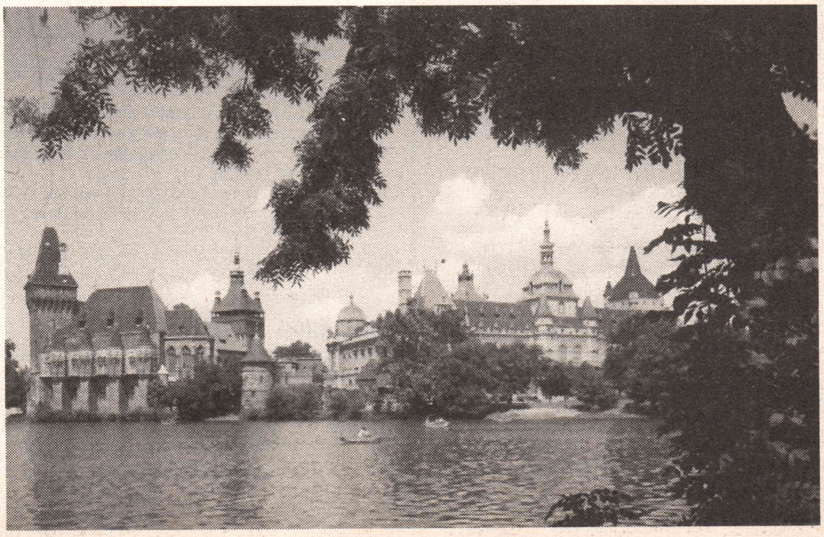
1130 UK, BBC London (af): Focus on Faith. See F 0130.
1130 UK, BBC London (am): People and Politics. See S 0130.
1130 UK, BBC London (as pac/eu/south as): Meridian. See S 0630.

HAUSER'S HIGHLIGHTS
SOUTH AFRICA: CHANNEL AFRICA W95

English

0300-0500	5955, 9585
0500-0600	7185, 11900
1500-1800	7240, 9545
1600-1700	15240

(Andy Sennitt, *WRTH*, RNMN)



This beautiful QSL f rom Radio Budapest was sent to MT by John C. Wells of New York

FREQUENCIES

1200-1300	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9610as	11800pa	15565as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radiobras	15445na			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	13650am	
1200-1300	China, China Radio Intl	8425na	9655as	9715as	11660as
		11795pa	15440pa		
1200-1230 vl	China, China Radio Intl	8660as	11445as	12110as	15135as
1200-1300	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am
1200-1300	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1200-1300	Ecuador, HCJB Quito	12005am	15115am	21455am	
1200-1300	France, Radio France Intl	9805eu	11615au	13625na	15155eu
		15195eu	15325af	15530na	
1200-1230	Iran, VOIRI Tehran	11745as	11790as	11875me	11930me
		15260af	17750me		
1200-1300	Iraq, Radio Iraq Intl	13680eu			
1200-1300	Jordan, Radio	11970na			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1250	Myanmar, Voice of	5990do			
1200-1300	Netherlands, Radio	6045eu	7190eu		
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1300 vl	Palau, KHBN/Voice of Hope	9965as			
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do		
1200-1300	Russia, Voice of	4740as	4975as	5960as	7150as
		9540na	9800pa	9895as	11820as
		11880as	13370as	15105as	15110as
		15405as	15435as	15510eu	15560as
		15570as	17590as	17600as	17645as
		17755as	17765as	17775as	17780as
		17835as	17870as	17890as	
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7285as			
1200-1230	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom,BBC London	6190af	6195va	9410va	9515na
		9575as	9740va	11365am	11750as
		11760me	11765as	11865va	11940af
		11955as	12095va	15070va	15310as
		15360as	15575me	17640va	17705va
	17830af	17885af	21660af		
1200-1300	USA, KAIJ Dallas TX	5810am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9355as	9430au	9455sa
1200-1300	USA, VOA Washington DC	6110va	9645va	9760va	11715va
		15160va	15425va		
1200-1300	USA, WEWN Birmingham AL	7425na			
1200-1300	USA, WHRI Noblesville IN	6040am	6185am	9930am	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WRMI/R Miami Intl	9955am			
1200-1300 a	USA, WVHA Greenbush ME	11695af			
1200-1300	USA, WWCR Nashville TN	5935am	7435am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	11830na	11970na	
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300	Bangladesh, Radio	9548as	13615as		
1230-1300	Bulgaria, Radio	15635as	17625as		
1230-1300	Canada, RCI Montreal	9660as	11855na	15195as	
1230-1300	Finland, YLE/Radio	11735na	15400na		
1230-1300 w	Indonesia, RRI Sorong	4875do			
1230-1300 a	Monaco, Trans World Radio	7115eu			
1230-1255 s	Monaco, Trans World Radio	7115eu			
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670eu	
1230-1300	Sweden, Radio	9835as	13740pa	15240pa	
1230-1300	Vietnam, Voice of	7250as	9840as	15010as	
1240-1250	Greece, Voice of	9935af	11645af	15630af	15650af

SELECTED PROGRAMS

Sundays

1200 UK, BBC London (af/as pac): Play of the Week (from 1130). See S 1130.
1205 UK, BBC London (am/eu/south as): World Business Brief. Focus on the market week.
1215 UK, BBC London (am): Anything Goes. A variety of music and much more with Bob Holness.
1215 UK, BBC London (eu): Britain Today. See S 0045.
1215 UK, BBC London (south as): A Jolly Good Show. See S 0415.
1230 UK, BBC London (af): On Screen. Film reviews and movie news from around the world.
1230 UK, BBC London (as pac): Andy Kershaw's World of Music. Recordings of diverse music from around the world.
1230 UK, BBC London (eu): Anything Goes. See S 1215.
1245 UK, BBC London (af/am): Sports Roundup. See S 0315.

Mondays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Report. Latest news from the markets in the Far East, Europe and the USA.
1205 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): Variable Feature. See S 0005.
1230 UK, BBC London (af): Development '95. See M 0530.
1230 UK, BBC London (as pac): Off the Shelf. See M 0145.
1230 UK, BBC London (eu): Variable Music Feature. See S 0230.
1230 UK, BBC London (south as): Andy Kershaw's World of Music. See S 1230.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0315.

Tuesdays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): John Peel. See S 0530.
1230 UK, BBC London (af): Folk Routes. See T 0030.
1230 UK, BBC London (as pac): Off the Shelf. See M 0145.
1230 UK, BBC London (eu): From Hoplite to Harrier. See M 0630.
1230 UK, BBC London (south as): Multitrack Hit List. See M 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0315.

Wednesdays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
1230 UK, BBC London (af): Media Feature. A Week on the Web. See T 0530.
1230 UK, BBC London (as pac): Off the Shelf. See M 0145.
1230 UK, BBC London (eu): Composer of the Month. See S 0530.
1230 UK, BBC London (south as): Megamix. See T 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0315.

Thursdays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): Variable Music Feature. See S 0230.
1230 UK, BBC London (af): From Our Own Correspondent. See S 0130.
1230 UK, BBC London (as pac): Off the Shelf. See M 0145.
1230 UK, BBC London (eu): Assignment. See H 0130.
1230 UK, BBC London (south as): Multitrack X-Press. See W 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0315.

Fridays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): New Ideas. See H 0115.
1230 UK, BBC London (af): The Farming World. See M 0015.
1230 UK, BBC London (as pac): Off the Shelf. See M 0145.
1230 UK, BBC London (eu): Science in Action. See S 0430.
1230 UK, BBC London (south as): Popular Music Feature. Bhangra Beat with DJ Ritu (3rd,10th,17th). See T 0630.
1230 UK, BBC London (south as): Variable Music Feature (24th). See S 0230.
1235 UK, BBC London (am): Waveguide. See S 0350.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0315.

Saturdays

1205 UK, BBC London (af/am/as pac/eu/south as): World Business Review. See S 0305.
1215 UK, BBC London (af/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): A Jolly Good Show. See S 0415.
1215 UK, BBC London (as pac): Science in Action. See S 0430.
1230 UK, BBC London (af): From the Weeklies. See A 0030.
1230 UK, BBC London (eu): Musical Quiz Feature. NEW! Counterpoint. Ned Sherrin presents the musical quiz that features questions ranging from rock to baroque.
1230 UK, BBC London (south as): Multitrack Alternative. See F 1330.
1245 UK, BBC London (af): Variable Feature. See S 0005.
1245 UK, BBC London (as pac): Letter from America. See S 0030.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9560pa	9610as
		11800pa			
1300-1330	Australia, Radio	6060pa	6080as	9510pa	
1300-1320	Brazil, Radiobras	15445na			
1300-1330	Bulgaria, Radio	15635as	17625as		
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	7405na	9715as	11660pa	15440pa
1300-1400	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1300-1400	Ecuador, HCJB Quito	12005am	15115am	21455am	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400	Iraq, Radio Iraq Intl	13680as			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1325	Netherlands, Radio	6045eu	7190eu		
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as
		15430as			
1300-1330 s	Norway, Radio Norway Intl	7315as	9590eu	15605as	
1300-1400 vl	Palau, KHBN/Voice of Hope	9965as			
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1400	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	11945eu	15365eu	17720eu	
1300-1400	Russia, Voice of	9540na	9800pa	9895as	11940as
		13370as	17675as	17685as	17725as
		17745as	17755as	17780as	17795as
		17815as	17835as		
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15545as
1300-1400	United Kingdom,BBC London	6190af	6195va	7180as	9410va
		9515na	9740va	11365am	11750as
		11760me	11860af	11865va	11940af
		12095va	15070va	15310as	15575me
		17640va	17705va	17830af	17885af
	21470af	21660af			
1300-1400	USA, KAIJ Dallas TX	5810am			
1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455na	13625au
1300-1400	USA, VOA Washington DC	6110va	9645va	9760va	11715va
		15160va	15425va		
1300-1400	USA, WEWN Birmingham AL	7425na	11875na		
1300-1400 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1300-1400	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WRMI/R Miami Intl	9955am			
1300-1400 a	USA, WVHA Greenbush ME	11695af			
1300-1400	USA, WWCR Nashville TN	5935am	7435am	15685am	
1300-1400	USA, WYFR Okeechobee FL	5950na	11830na		
1300-1345	USA, WYFR Okeechobee FL	11970na			
1300-1330	Uzbekistan, R Tashkent	7285eu	9715eu	15295eu	17815eu
1307-1400 occsnal	New Zealand, R NZ Intl	9655pa			
1330-1400	Austria, R Austria Intl	15450as			
1330-1400 s	Belgium, R Vlaanderen Int	13670na			
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Canada, RCI Montreal	15315eu	15325eu	17820eu	17895eu
		21455eu			
1330-1400	Finland, YLE/Radio	11735na	15400na		
1330-1400	India, All India Radio	13732as	15120as		
1330-1355	Moldova, R Moldova Intl	15315na			
1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1330-1400	Sweden, Radio	11650na	15240na		
1330-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1330-1400	Turkey, Voice of	9445as			
1330-1355	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
1330-1400	Vietnam, Voice of	7250as	9840as	15010as	
1345-1400	Vatican State, Vatican R	11625as	13765as	15585as	
1350-1400	USA, WYFR Okeechobee FL	17760na			

SELECTED PROGRAMS

Sundays

1300 Norway, Radio Norway Intl: Norway Now. A weekly magazine of news from Norway and special features about politics, economy, foreign relations, culture, and everyday life.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1300 USA, WEWN Birmingham AL: Sunday Mass Live. From Our Lady of the Angels Monastery.
1330 India, All India Radio: News and Commentary.
1330 Philippines, FEBC Manila: FEBC DX Dial. A program for shortwave listening.
1335 Philippines, FEBC Manila: Computer Corner. Five minutes of news from the world of computers.
1340 Philippines, FEBC Manila: Mailbag. Letters are read and answered on the air.
1345 India, All India Radio: Program Preview.
1345 Vatican State, Vatican Radio: With Heart and Mind. See S 0250.
1346 India, All India Radio: Musical Interlude.
1352 Vatican State, Vatican Radio: On-the-Air. See S 0258.
1355 Philippines, FEBC Manila: The Way to Life. Dick Saunders explores the Bible.

Mondays

1300 UK, BBC London (af): College of the Air (Alternative). Educational programs for Africa.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 India, All India Radio: News and Commentary.
1330 UK, BBC London (af): John Peel (Alternative). See S 0530.
1340 Philippines, FEBC Manila: Computer Corner. See S 1335.
1345 India, All India Radio: Program Preview.
1345 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
1345 Vatican State, Vatican Radio: Catholic Writers. See M 0250.
1355 Philippines, FEBC Manila: The Way to Life. See S 1355.

Tuesdays

1300 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 India, All India Radio: News and Commentary.
1330 UK, BBC London (af): Multitrack Hit List (Alternative). See M 1615.
1340 Philippines, FEBC Manila: Computer Corner. See S 1335.
1345 India, All India Radio: Program Preview.
1345 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
1345 Vatican State, Vatican Radio: A Room with a View of the Vatican. See T 0250.
1355 Philippines, FEBC Manila: The Way to Life. See S 1355.
1359 Vatican State, Vatican Radio: Ask the Abbot. See T 0304.

Wednesdays

1300 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1315 Philippines, FEBC Manila: FEBC DX Dial. See S 1330.
1330 India, All India Radio: News and Commentary.
1330 UK, BBC London (af): Megamix (Alternative). See T 1615.
1340 Philippines, FEBC Manila: Computer Corner. See S 1335.
1345 India, All India Radio: Program Preview.
1345 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
1345 Vatican State, Vatican Radio: The Rome Report. See W 0250.
1346 India, All India Radio: Indian Music.
1355 Philippines, FEBC Manila: The Way to Life. See S 1355.

Thursdays

1300 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 India, All India Radio: News and Commentary.
1330 UK, BBC London (af): Multitrack X-Press (Alternative). See W 1615.
1340 Philippines, FEBC Manila: Computer Corner. See S 1335.
1345 India, All India Radio: Program Preview.
1345 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
1345 Vatican State, Vatican Radio: Pilgrim City (biweekly). See H 0250.
1345 Vatican State, Vatican Radio: The Pope and the People (biweekly). See H 0250.
1346 India, All India Radio: Listeners' Choice.
1355 Philippines, FEBC Manila: The Way to Life. See S 1355.
1359 Vatican State, Vatican Radio: Postcards from Rome. See W 2300.

Fridays

1300 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 India, All India Radio: News and Commentary.
1330 UK, BBC London (af): Multitrack Alternative (Alternative). Latest developments on the British music scene.
1340 Philippines, FEBC Manila: Computer Corner. See S 1335.
1345 India, All India Radio: Program Preview.
1345 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
1345 Vatican State, Vatican Radio: Then and Now. See F 0250.
1346 India, All India Radio: Indian Music.
1355 Philippines, FEBC Manila: The Way to Life. See S 1355.

Saturdays

1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 India, All India Radio: News and Commentary.
1345 India, All India Radio: Program Preview.
1346 India, All India Radio: UN News Magazine.
1351 Vatican State, Vatican Radio: Facing the Challenge. The difficulties of living in Rome.
1356 Vatican State, Vatican Radio: What Can I Do?. See W 0306.

1400 UTC SHORTWAVE GUIDE 9:00 AM EST 6:00 AM PST

FREQUENCIES

1400-1430	Australia, Radio	7240pa	9560as	9610pa	11695pa
1400-1500	Australia, Radio	5995pa	11800pa		
1400-1500	Australia,DefenseForces R	8743af	10623af		
1400-1430 mtwhfa	Belgium, R Vlaanderen Int	13670na			
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500	China, China Radio Intl	7405na	11815as		
1400-1500	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1400-1500	Ecuador, HCJB Quito	12005am	15115am	21455am	
1400-1500	France, Radio France Intl	7110as	15405as	17560as	17695as
1400-1500	India, All India Radio	13732as	15120as		
1400-1500	Japan, NHK/Radio	6090as	9535na	9695as	11705na
		11895as			
1400-1500	Lebanon, Wings of Hope	9960va			
1400-1500	Malaysia, Radio	7295do			
1400-1500 vl	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1500 mtwhfa	Malta, V of Mediterranean	11925me			
1400-1435 s	Malta, V of Mediterranean	11925me			
1400-1500 s	Morocco, RTV Marocaine	17575af			
1400-1500	Netherlands, Radio	9895as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa			
1400-1430 s	Norway, Radio Norway Intl	11840na			
1400-1500 vl	Palau, KHBN/Voice of Hope	9965as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia, Voice of	9595as	11835as	11910as	11935as
		11945sa	11985me	12025as	13770as
		15320me	15425me	15540me	17570af
		17710me	17780as		
1400-1500	Singapore, SBC Radio One	6155do			
1400-1430	Turkey, Voice of	9445eu	9630as		
1400-1500	United Kingdom,BBC London	6190af	6195as	7180as	9410va
		9515na	9740va	11365am	11750as
		11865va	11940af	12095va	15070va
		15310as	15575me	17640va	17705va
		17830af	21470af	21660af	
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, VOA Washington DC	6110va	7125va	7215va	9645va
		9760va	15160va	15255va	15395va
		15425va			
1400-1500	USA, WEWN Birmingham AL	9455na	11875na		
1400-1500 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1400-1500	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1445 a	USA, WVHA Greenbush ME	11695af			
1400-1500	USA, WWCR Nashville TN	7435am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	11830na	17760na		
1400-1415	Vatican State, Vatican R	11625as	13765as	15585au	
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	6060pa	6080pa	7260as	9710pa
		11660as	11695pa		
1430-1500	Austria, R Austria Intl	6155eu	13730eu	15450as	
1430-1500 vl	China, China Radio Intl	8660as	11445as	15135as	
1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1458	Uzbekistan, R Tashkent	7285eu	9715eu	15295eu	17815eu
1435-1450	Greece, Voice of	9420na	15650na		
1440-1500	Myanmar, Voice of	5990do	7185do		
1445-1500	Mongolia, R Ulan Bator	7290as	9950as		
1458-1500 mtwhfa	Seychelles, FEBA Radio	9810as			
1458-1500 s	Seychelles, FEBA Radio	11870as			

SELECTED PROGRAMS

Sundays

1401 UK, BBC London (af/eu): A Jolly Good Show. See S 0415.
1405 UK, BBC London (af): Play of the Week (Alternative). See S 1130.
1405 UK, BBC London (am/south as): Variable Feature. See S 0005.
1405 UK, BBC London (as pac): Write On. See S 0145.
1415 UK, BBC London (am): Music Review. News and views from the world of music.
1415 UK, BBC London (as pac): Concert Hall. Classical music concerts.
1430 UK, BBC London (south as): Anything Goes. See S 1215.
1445 UK, BBC London (af): Country Style. Wally Whyton plays a selection of the best in country music.
1445 UK, BBC London (eu): Letter from America. See S 0030.

Mondays

1405 UK, BBC London (af): Omnibus. See M 1130.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
1430 UK, BBC London (af): From Hoplite to Harrier (Alternative). See M 0630.
1430 UK, BBC London (af): Off the Shelf. See M 0145.
1430 UK, BBC London (am): Omnibus. See M 1130.
1430 UK, BBC London (as pac): Health Matters. See M 0445.
1430 UK, BBC London (eu): John Peel. See S 0530.
1430 UK, BBC London (south as): Variable Feature. See S 0005.
1445 UK, BBC London (af): The Farming World. See M 0015.
1445 UK, BBC London (as pac): Variable Feature. See S 0005.
1445 UK, BBC London (south as): Development '95. See M 0530.

Tuesdays

1405 UK, BBC London (af): Variable Feature. See S 0005.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1430 UK, BBC London (af): Off the Shelf. See M 0145.
1430 UK, BBC London (am): Health Matters. See M 0445.
1430 UK, BBC London (as pac): Discovery. See T 0230.
1430 UK, BBC London (eu): Multitrack Hit List. See M 1615.
1430 UK, BBC London (south as): Variable Feature (21st,28th). See S 0005.
1430 UK, BBC London (south as): Western Philosophers in a Nutshell (7th,14th). See M 0445.
1445 UK, BBC London (af): The Learning World. See S 0030.

1445 UK, BBC London (am): Variable Feature. See S 0005.
1445 UK, BBC London (south as): Health Matters. See M 0445.

Wednesdays

1401 UK, BBC London (af): Discovery. See T 0230.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1430 UK, BBC London (af): Off the Shelf. See M 0145.
1430 UK, BBC London (am): Country Style. See S 1445.
1430 UK, BBC London (as pac): Omnibus. See M 1130.
1430 UK, BBC London (eu): Megamix. See T 1615.
1430 UK, BBC London (south as): Media Feature. A Week on the Web. See T 0530.
1445 UK, BBC London (af/am/south as): Good Books. See M 0030.

Thursdays

1401 UK, BBC London (af): Health Matters. See M 0445.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1430 UK, BBC London (af): Off the Shelf. See M 0145.
1430 UK, BBC London (am): Network UK. Issues and events affecting the lives of people throughout the UK.
1430 UK, BBC London (as pac): Assignment. See H 0130.
1430 UK, BBC London (eu): Multitrack X-Press. See W 1615.
1430 UK, BBC London (south as): Sports International. See H 0230.
1445 UK, BBC London (af): Popular Music Feature. Local Heroes (2nd). See S 0445.
1445 UK, BBC London (af): Variable Feature (9th,16th,23rd,30th). See S 0005.

Fridays

1401 UK, BBC London (af): Science in Action. See S 0430.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1430 UK, BBC London (af): Off the Shelf. See M 0145.
1430 UK, BBC London (am/south as): Variable Feature. See S 0005.

1430 UK, BBC London (as pac): Focus on Faith. See F 0130.
1430 UK, BBC London (eu): Multitrack Alternative. See F 1330.
1430 UK, BBC London (south as): The Secret Life of a Song. See H 0545.
1445 UK, BBC London (af): On the Move. See S 0615.
1445 UK, BBC London (am): The Farming World. See M 0015.
1445 UK, BBC London (south as): Global Concerns. See F 0145.

Saturdays

1405 UK, BBC London (af/am/as pac/eu/south as): Sportsworld. The weekly sports magazine.
1450 UK, BBC London (af): Write On (Alternative). See S 0145.

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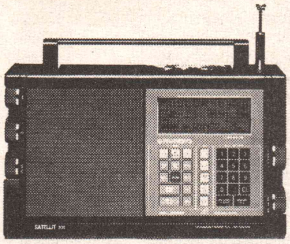

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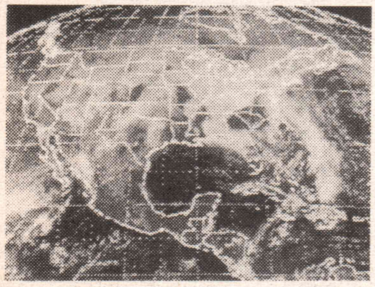

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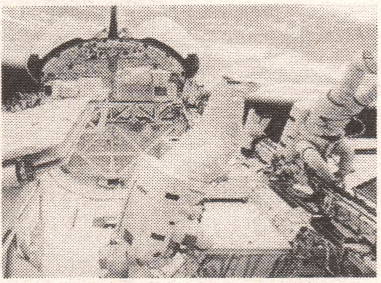

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1500 UTC SHORTWAVE GUIDE 10:00 AM EST 7:00 AM PST

FREQUENCIES

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9615as	9710pa	11660as	11695pa
		11800pa			
1500-1600	Australia,DefenseForces R	8743af	10623af	15535af	
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	11815as	15165as		
1500-1600	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1500-1600	Ecuador, HCJB Quito	12005am	15115am	21455am	
1500-1600	Guam, TWR/KTWR	11580as			
1500-1600	Japan, NHK/Radio	7240as	9535na	9695as	15355af
1500-1600	Jordan, Radio	11970na			
1500-1600	Lebanon, Wings of Hope	9960va			
1500-1600	Malaysia, Radio	7295do			
1500-1600 vl	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1525 mtwhfa	Moldova, R Moldova Intl	11580eu			
1500-1515	Mongolia, R Ulan Bator	7290as	9950as		
1500-1525	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	6100pa			
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9977na	13785me
1500-1530 s	Norway, Radio Norway Intl	9520me	11730me		
1500-1600 vl	Palau, KHBN/Voice of Hope	9965as			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Voice of	4940as	4975as	7305me	9595as
		11775as	11890as	11910as	11945sa
		12025as	12035me	15320me	15400af
		15480as	15540me	17570af	17750me
1500-1600	S Africa, Channel Africa	7240af	9545af		
1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as			
1500-1530 s	Seychelles, FEBA Radio	11870as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Slovakia, AWR	13595am			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	12075as	13635as	15545as	
1500-1600	United Kingdom,BBC London	5965as	5975as	6190af	6195as
		7180as	9410va	9515na	9740va
		11365am	11750as	11775va	11865va
		11940af	12095va	15070va	17705va
		17830af	21470af	21660af	
1500-1530	United Kingdom,BBC London	11860af	15400eu	17880af	21490af
1500-1600	USA, KTBN Salt Lk City UT	15590am			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	6040me	6110as	7125as	7215as
		9645as	9700as	9760va	15205as
		15255as	15395as		
1500-1600	USA, WEWN Birmingham AL	9455na	11875na		
1500-1600 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420am			
1500-1600 a	USA, WVHA Greenbush ME	15665af			
1500-1600	USA, WWCR Nashville TN	12160am	13845am	15685am	
1500-1600	USA, WYFR Okeechobee FL	11830na	17760na		
1530-1600	Iran, VOIRI Tehran	11875as	15260as	17750as	
1530-1600	Netherlands, Radio	9890as	15150as		
1530-1600	United Kingdom,BBC London	11765as			
1545-1600	Vatican State, Vatican R	11640as	15585as		

SELECTED PROGRAMS

Sundays

1501 UK, BBC London (south as): Play of the Week. See S 1130.
1505 UK, BBC London (af): The Art House. See S 0435.
1505 UK, BBC London (am): From Our Own Correspondent. See S 0130.
1505 UK, BBC London (as pac/eu): Sports Roundup. See S 0315.
1515 UK, BBC London (as pac/eu): Variable Feature. See S 0005.
1525 UK, BBC London (am): Book Choice. Opening a newly published book.
1530 UK, BBC London (af): BBC English. For learners of English.
1530 UK, BBC London (am): Variable Comedy/Quiz Feature. These programs are panel quizes and other light entertainment in a format heard in America decades ago.

Mondays

1500 UK, BBC London (af): John Peel (Alternative). See S 0530.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.
1505 UK, BBC London (am): Among My Souvenirs. See S 0435.
1505 UK, BBC London (eu/south as): Sports Roundup. See S 0315.
1515 UK, BBC London (am/south as): Variable Feature. See S 0005.
1515 UK, BBC London (eu): Concert Hall. See S 1415.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (as pac): BBC English. See S 1530.
1545 UK, BBC London (as pac): Slow-speed News. News reports read slowly for listeners who are learning English.
1555 UK, BBC London (af): Words of Faith. See S 0555.

Tuesdays

1500 UK, BBC London (af): Multitrack Hit List (Alternative). See M 1615.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am): Variable Feature. See S 0005.
1505 UK, BBC London (eu/south as): Sports Roundup. See S 0315.
1515 UK, BBC London (am): The Greenfield Collection. This classical music program replaces Ray on Record.
1515 UK, BBC London (eu): On Screen. See S 1230.
1515 UK, BBC London (south as): Concert Hall. See S 1415.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (as pac): BBC English. See S 1530.
1530 UK, BBC London (eu): Omnibus. See M 1130.
1545 UK, BBC London (as pac): Slow-speed News. See M 1545.
1555 UK, BBC London (af): Words of Faith. See S 0555.

Wednesdays

1500 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am): Variable Feature. See S 0005.
1505 UK, BBC London (as pac): BBC English. See S 1530.
1505 UK, BBC London (eu/south as): Sports Roundup. See S 0315.
1515 UK, BBC London (am): Variable Feature (15th,22nd,29th). See S 0005.
1515 UK, BBC London (am): Western Philosophers in a Nutshell (1st,8th). See M 0445.
1515 UK, BBC London (eu): BBC English (Britain Now). See S 1530.
1515 UK, BBC London (south as): From Our Own Correspondent. See S 0130.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (am): The Ed Stewart Show. See S 0230.
1530 UK, BBC London (eu): Discovery. See T 0230.
1530 UK, BBC London (south as): Waveguide. See S 0350.
1540 UK, BBC London (south as): Book Choice. See S 1525.
1545 UK, BBC London (as pac): Slow-speed News. See M 1545.
1545 UK, BBC London (south as): On Screen. See S 1230.
1555 UK, BBC London (af): Words of Faith. See S 0555.

Thursdays

1500 UK, BBC London (af): College of the Air (Alternative). See M 1300.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am): UK Album Chart. See T 0005.
1505 UK, BBC London (eu/south as): Sports Roundup. See S 0315.
1515 UK, BBC London (am/eu): The Learning World. See S 0030.
1515 UK, BBC London (south as): Assignment. See H 0130.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (am): Megamix. See T 1615.
1530 UK, BBC London (as pac): BBC English. See S 1530.
1530 UK, BBC London (eu): Network UK. See H 1430.
1545 UK, BBC London (as pac): Slow-speed News. See M 1545.
1545 UK, BBC London (south as): The Learning World. See S 0030.
1555 UK, BBC London (af): Words of Faith. See S 0555.

Fridays

1500 UK, BBC London (af): Multitrack Alternative (Alternative). See F 1330.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am): Variable Feature. See S 0005.
1505 UK, BBC London (as pac): BBC English. See S 1530.
1505 UK, BBC London (eu/south as): Sports Roundup. See S 0315.
1505 UK, BBC London (south as): Sports Roundup. See S 0315.
1515 UK, BBC London (am): Concert Hall. See S 1415.
1515 UK, BBC London (eu): Music Review. See S 1415.
1515 UK, BBC London (south as): Variable Feature. See S 0005.
1530 UK, BBC London (af): Outlook. See M 1405.
1545 UK, BBC London (as pac): Slow-speed News. See M 1545.
1545 UK, BBC London (south as): Short Story. See S 0430.
1555 UK, BBC London (af): Words of Faith. See S 0555.

Saturdays

1505 UK, BBC London (af/am/as pac/eu/south pac): Sportsworld. See A 1405.

HAUSER'S HIGHLIGHTS

AUSTRIA: ORF W-95

English to Americas

1130	13730-North
2230	9870-Cnetral
0130	9655-North
0230	9655-North
	9870-Central
	13730-South
0530	6015-North via Canada
0630	6015-North via Canada

FREQUENCIES

1600-1700	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	9860pa	11660pa
		11695pa	11800pa		
1600-1613	Bangladesh, Radio	15520as			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	4130af	11575as	15110af	
1600-1700	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1600-1700	Ecuador, HCJB Quito	12005am	15115am	21455am	
1600-1630	Ethiopia, Radio	7165af			
1600-1700	France, Radio France Intl	6175eu	11615af	11700af	12015af
		15210af	15460af	15530af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9585as
		13610af	15145af		
1600-1700	Guam, AWR/KSDA	9370as			
1600-1615 mt	Guam, TWR/KTWR	11580as			
1600-1630 whfas	Guam, TWR/KTWR	11580as			
1600-1630	Iran, VOIRI Tehran	11875as	15260as	17750as	
1600-1700	Italy, AWR Europe	7230eu			
1600-1700	Malaysia, Radio	7295do			
1600-1625	Netherlands, Radio	9895as	9895as	13700as	15150as
1600-1649 occsnal	New Zealand, R NZ Intl	9655pa			
1600-1630	Pakistan, Radio	7425af	9485af	11570af	11710af
		13590af	15555af	17660af	
1600-1700 vl	Palau, KHBN/Voice of Hope	9965as			
1600-1700	Russia, Voice of	7350eu	9480eu	9820af	9880af
		11630eu	11675eu	11775as	11860af
		11890as	11910as	11945sa	11990af
		12025as	15385as	15400af	15480as
		15540me	17570af	17875af	21740af
1600-1700	S Africa, Channel Africa	7240af	9545af	15240af	
1600-1700	S Africa, Trans World R	9500af			
1600-1700	Singapore, SBC Radio One	6155do			
1600-1700	South Korea, R Korea Intl	5975as	6480eu	9515af	9870af
1600-1630	Sri Lanka, SLBC Colombo	9720as	15425as		
1600-1640	UAE, Radio Dubai	11795na	13675eu	15395me	17825me
		21605me			
1600-1700	United Kingdom,BBC London	3915as	5975as	6190af	6195va
		7180as	9410va	9510as	9515na
		9740va	11750as	11775va	11795va
		15070va	15400eu	17830va	21660af
1600-1615	United Kingdom,BBC London	5965as	6195as	11365am	11865va
		17705va	21470af		
1600-1630	United Kingdom,BBC London	11860af	11940af	12095va	
1600-1700	USA, KAIJ Dallas TX	13815am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9355af	21640af		
1600-1700	USA, VOA Washington DC	3970af	6040me	6110va	7125as
		7215as	9645as	9700as	9760va
		11920af	12040af	13710af	15205as
		15225af	15255as	15395as	15410af
		15445af	17895af		
1600-1700	USA, WEWN Birmingham AL	11580na	13615na		
1600-1700 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700 a	USA, WVHA Greenbush ME	15665eu			
1600-1700	USA, WWCR Nashville TN	12160am	13845am	15685am	
1600-1700	USA, WYFR Okeechobee FL	11830na	17760na		
1600-1630	Vietnam, Voice of	7250eu	9840eu	15010eu	
1615-1700	United Kingdom,BBC London	3255af	9630af		
1630-1700	Austria, R Austria Intl	11780as			
1630-1657	Canada, RCI Montreal	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Finland, YLE/Radio	11785na	13645na		
1630-1700 mtwhfa	USA, WRMI/R Miami Intl	9925am			
1645-1700 mtwhf	Canada, RCI Montreal	9555eu	11935eu	15325eu	17820eu
1650-1700 mtwhf	New Zealand, R NZ Intl	5960pa			

SELECTED PROGRAMS

Sundays

1615 UK, BBC London (af): Variable Music Feature. See S 0230.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): The Ed Stewart Show. See S 0230.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Letter from America. See S 0030.
1630 UK, BBC London (eu): Fourth Estate. See S 0330.
1630 UK, BBC London (south as): Variable Feature. See S 0005.
1645 UK, BBC London (af): Waveguide. See S 0350.
1645 UK, BBC London (am/eu): Britain Today. See S 0045.
1645 UK, BBC London (as pac): Short Story. See S 0430.
1655 UK, BBC London (af): Book Choice. See S 1525.

Mondays

1615 UK, BBC London (af): Fast Track. The latest African sports news and action.
1615 UK, BBC London (am): From Hoplite to Harrier. See M 0630.
1615 UK, BBC London (as pac): Multitrack Hit List. The UK Top 20.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Omnibus. See M 1130.
1630 UK, BBC London (eu): The World Today. Examines thoroughly a topical aspect of the international scene.
1645 UK, BBC London (af): The World Today. See M 1630.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1630.

Tuesdays

1615 UK, BBC London (af): Money Focus. African business magazine.
1615 UK, BBC London (am): Folk Routes. See T 0030.
1615 UK, BBC London (as pac): Megamix. A youth magazine series which covers new trends, entertainment, sport and other issues.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Megamix. See T 1615.
1630 UK, BBC London (am): Media Feature. A Week on the Web. See T 0530.
1630 UK, BBC London (eu): The World Today. See M 1630.
1645 UK, BBC London (af): The World Today. See M 1630.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1630.

Wednesdays

1615 UK, BBC London (af): Talkabout Africa. Telephone conversations with BBC correspondents on late-breaking African events.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): Multitrack X-Press. New pop records, interviews, news and competitions.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Discovery. See T 0230.
1630 UK, BBC London (eu): The World Today. See M 1630.
1645 UK, BBC London (af): The World Today. See M 1630.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1630.

Thursdays

1615 UK, BBC London (af): Jive Zone. Get in the groove with all the latest sounds on the Afro music scene.
1615 UK, BBC London (am): Sports International. See H 0230.
1615 UK, BBC London (as pac): Variable Music Feature. See S 0230.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Network UK. See H 1430.
1630 UK, BBC London (eu): The World Today. See M 1630.
1645 UK, BBC London (af): The World Today. See M 1630.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1630.

Fridays

1615 UK, BBC London (af): African Perspective. See S 0631.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): Multitrack Alternative. See F 1330.
1615 UK, BBC London (eu): BBC English. See S 1530.
1615 UK, BBC London (south as): Science in Action. See S 0430.
1630 UK, BBC London (eu): The World Today. See M 1630.
1645 UK, BBC London (af): The World Today. See M 1630.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1630.

Saturdays

1615 UK, BBC London (af/am/as pac/eu/south as): Sportsworld. See A 1405.

THANK YOU ...

Additional contributors to this month's Shortwave Guide:

John Babbis, Silver Spring, MD; Paul Donegan, Glendale, CA; Bob Fraser, Cohasset, MA; Clyde Harmon, Anniston, AL; Jim Moats, Ravenna, OH; Robert E. Thomas, Bridgeport, CT; Loyd Van Horn, Brasstown, NC; Jerry Witham, Keaau, HI; DX Ontario; NASWA *Journal*; BBCMS; BBC *Worldwide*; BBC *Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn. Thanks also to Tom Sundstrom (TRS Consulting) of Vincentown, NJ for timely program information for these columns.

FREQUENCIES

1700-1715	Albania, R Tirana Intl	7155eu	9760eu		
1700-1800	Australia, Radio	6060pa	6080pa	6090pa	7260as
		9580pa	9710pa	9860pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Canada, CBC N Quebec Svc	9625do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl				
		7405af			
			9535as		
				11575af	
1700-1800 as	Costa Rica, AWR Alajuela	13750am			
1700-1800	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1700-1727	Czech Rep, Radio Prague	5930eu	17485af		
1700-1800	Ecuador, HCJB Quito	12005am	15115am	21455am	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1730	France, Radio France Intl	15210af	15460af		
1700-1730	Georgia, Georgian Radio	11910eu			
1700-1800	Japan, NHK/Radio	6150as	7280as	9535na	9580as
		11930me			
1700-1730	Jordan, Radio	11970na			
1700-1800	Lebanon, Voice of Hope	6280me			
1700-1730	Lebanon, Wings of Hope	9960va			
1700-1800 mtwhf	New Zealand, R NZ Intl	5960pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785me
1700-1800	Pakistan, Radio	7485eu	11570eu		
1700-1800 vl	Palau, KHBN/Voice of Hope	9965as			
1700-1800	Russia, Voice of	9480eu	9880af	11630eu	11715me
		11890as	11960af	11990eu	12065me
		15400af	15480as	17570af	17875af
		21740af			
1700-1800	S Africa, Channel Africa	7240af	9545af		
1700-1800	United Kingdom,BBC London	3255af	5965as	6180eu	6190af
		6195eu	7180as	9410va	9510as
		9740as	11750as	11860af	12095va
		15070va	15400va	17830af	
1700-1715	United Kingdom,BBC London	9515na	11775va		
1700-1745	United Kingdom,BBC London	3915as	9630af		
1700-1730	United Kingdom,BBC London	6005af			
1700-1800	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	6120as			
1700-1800	USA, Monitor Radio Intl	9355af	21640af		
1700-1800	USA, VOA Washington DC	3980va	6040va	6110as	7125as
		7150va	7170va	7215as	9645as
		9700as	9760va	9770va	11870va
		11920af	12040af	13710af	15205va
		15255as	15395as	15410af	15445af
	17895af	19379va			
1700-1800 mtwhf	USA, VOA Washington DC	5990va	6045va	9550va	
1700-1800	USA, WEWN Birmingham AL	11580na	13615na		
1700-1800 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRMI/R Miami Intl	9955am			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WVHA Greenbush ME	15745af			
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685am	
1700-1800	Zambia, Christian Voice	4965af			
1715-1730	Sweden, Radio	6065eu			
1715-1800	United Kingdom,BBC London	7160me			
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	11810eu
1730-1800	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	11655af	15315af	17605af
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Vatican State, Vatican R	11625af	13765af	15570af	
1745-1800 mtwhf	Armenia, Voice of	4810eu	7480eu	9675eu	11960me
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		

1800 UTC

1800-1900	Algeria, R Algiers Intl	11715me	15160eu		
1800-1900 mtwhf	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	6060pa	6080pa	6090pa	9580pa
		9860pa	11660as	11695pa	11880pa
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1845	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		
1800-1900	Kuwait, Radio	11990na			
1800-1900	Lebanon, Voice of Hope	6280me			
1800-1900	Netherlands, Radio	4945af	6015af	6020af	9605af
		9860af	9895af	11655af	15315af
		17605af			
1800-1849 mtwhf	New Zealand, R NZ Intl	5960pa			
1800-1900 vl	Palau, KHBN/Voice of Hope	9965as			
1800-1900	Poland, Polish R Warsaw	6095eu	7270eu	7285eu	
1800-1900	Russia, Voice of	6590eu	7350eu	9480eu	9755as
		9880eu	11630eu	11675eu	11775as
		11890as	11945sa	11960af	15400af
1800-1900	Slovakia, AWR	13595am	15620am		
1800-1900 irreg	Sudan, Radio Omdurman	9200af			
1800-1830	Swaziland, Trans World R	9500af			
1800-1830	Switzerland, Swiss R Intl	9885af	9905eu	12075me	13635me
1800-1900	United Kingdom,BBC London	3255af	6180eu	6190af	6195eu
		9410va	9740as	11860af	11955au
		12095va	15070va	15400va	17830af
1800-1830	United Kingdom,BBC London	5965as	7160me	9410as	9510as
1800-1815	United Kingdom,BBC London	7180as			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625au			
1800-1900	USA, Monitor Radio Intl	9355va	9370eu	21640af	
1800-1900	USA, VOA Washington DC	3980va	6040va	9760va	9770va
		11920af	12040af	13710af	15205va
		15410af	15580af	17895af	19379va
1800-1900 mtwhf	USA, VOA Washington DC	4875af			
1800-1900	USA, WEWN Birmingham AL	11580eu	13615na		
1800-1900 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRMI/R Miami Intl	9955am			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WVHA Greenbush ME	15745af			
1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am	
1800-1830	Vietnam, Voice of	7250eu	9840eu	15010eu	
1800-1900	Yemen, Yemeni Rep Radio	9780as			
1800-1900	Zambia, Christian Voice	4965af			
1815-1900	Bangladesh, Radio	7190eu	9647as	15520as	
1830-1900 t	Belarus, Radio Minsk	5905eu	7210eu	11840eu	11960eu
1830-1857	S Africa, Trans World R	9525af			
1830-1900	Sweden, Radio	6065eu	7240eu	9655af	
1830-1900	United Kingdom,BBC London	6005af	9630af		
1833-1900	Cote D' Ivoire, RDTV	11920do			
1840-1850	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			

Hauser's Highlights

KURDISTAN [& non?]:

V. of the People of Kurdistan is heard around 1500 on 4090; **V. of Iraqi Kurdistan** at 1630 in Arabic, 1830 in Kurdish on 4180; also an unlisted **R. Kurdistan** (*Aira Dangi Kurdistana*) at 1615 on 4106, moving around due to jamming (Victor Goonetilleke, Sri Lanka on RN *Media Network*). **V. of the People of Kurdistan** at 1800-1835+ on 4060.1//4027.8, next day on 4105.2//4035.6, and at 2110 on 4060.1//4035.0. (Finn Krone, Denmark via HCJB *TLC*) The same at 1845-1905* on 4109.9 (Krone on *Wavescan*).

V. of the Islamic Movement in Iraqi Kurdistan, first heard in Jan 94, is still heard on new sked: 0300-0430 & 1530-1700 on 4380, all in Kurdish. **V. of Iranian Kordestan** (Persian: *Seda-ye Kordestan-e Iran*; Kurdish: *Ira Dangi Kurdistani Irana*), after 3-month absence returned in August, heard on 4180-4195v to avoid interference, at 1300-1430, with unconfirmed repeat at 0230-0400; one hour later in winter. Earlier this year it was on either 4160 or 4280, but in August on 4180, same frequency as V. of *Iraqi* Kurdistan (BBCM)

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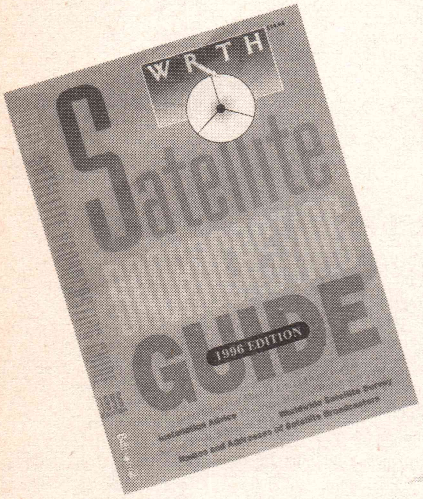

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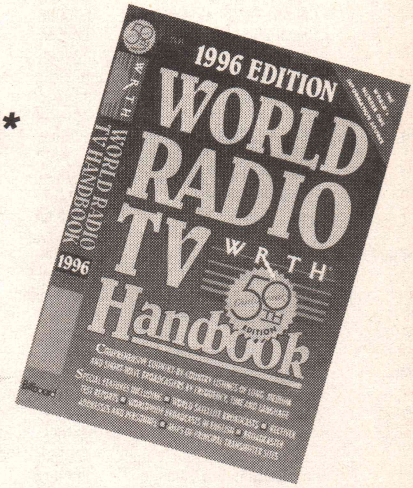

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1900 UTC
2:00 PM EST/11:00 AM PST

SHORTWAVE GUIDE

2000 UTC
3:00 PM EDT/12:00 M PDT

FREQUENCIES

1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa
		7260as	9560as	9580pa	9860pa
		11660pa	11695pa	11880pa	
1900-1930	Azerbaijan, Voice of	4957eu			
1900-1945	Bangladesh, Radio	7190eu	9647as	15520as	
1900-1930	Belgium, R Vlaanderen Int	5910eu	9925eu		
1900-1920	Brazil, Radiobras	15265eu			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000 vl	China, China Radio Intl	9440af	11515me		
1900-2000	Costa Rica, AWR Alajuela	13750am	15460am		
1900-2000	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB Quito	15490eu	21455am		
1900-1950	Germany, Deutsche Welle	9765af	11785af	11810af	13790as
		15145af	15425af		
1900-1910	Greece, Voice of	9375eu			
1900-2000	Guatemala, AWR	5980am			
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11935af
		13750as			
1900-2000 mtwh/vl	Italy, IRRS Milan	7125va			
1900-2000	Japan, NHK/Radio	6150as	7140pa	9535na	9580as
		11850pa			
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Lebanon, Voice of Hope	6280me			
1900-2000	Liberia, Radio ELBC	7275do			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000	Netherlands, Radio	4945af	6015af	6020af	9605af
		9860af	9895af	11655af	15315af
		17605af			
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, FRCN/Voice of	7255af			
1900-1930 s	Norway, Radio Norway Intl	5960eu	6195pa	7485af	9590af
1900-2000	Romania, R Romania Intl	9550eu	9690eu	11810eu	11940eu
1900-2000	Russia, Voice of	7230eu	7350eu	9480eu	9755as
		9865af	9880eu	11675eu	11775as
		11890as	11990af	15400af	15480as
		17570af	17875af		
1900-2000	South Korea, R Korea Intl	5975eu	6480eu	7275as	
1900-2000	Swaziland, Trans World R	3200af			
1900-2000	Thailand, Radio	7200eu	9655eu	11905eu	
1900-2000	United Kingdom,BBC London	3255af	6005af	6190af	6195eu
		7160va	9410va	9630af	9740au
		11955au	12095va	15070va	17830af
1900-2000	USA, KAIJ Dallas TX	13815am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625au			
1900-2000	USA, Monitor Radio Intl	9355eu	9370eu	17510af	
1900-2000	USA, VOA Washington DC	3980va	7375af	7415af	9525va
		9760va	9770va	11870va	11920af
		12040af	15180va	15205va	15410af
		15445af	15580af	19379va	
1900-2000	USA, WEWN Birmingham AL	7425eu	13615na	13695af	
1900-2000 irreg	USA, WGTG McCaysville GA	7315am	7355am		
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WVHA Greenbush ME	15745af			
1900-2000	USA, WWCR Nashville TN	12160am	13845am	15685am	
1900-1930	Vietnam, Voice of	7250eu	9840eu	15010eu	
1900-2000	Zambia, Christian Voice	4965af			
1900-2000	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1930-2000	Albania, R Tirana Intl	7260eu	9730eu		
1930-2000	Austria, R Austria Intl	5945eu	6155eu	9655me	13730af
1930-2000	Iran, VOIRI Tehran	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	4080as	7530as		
1930-2000	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1930-2000	Turkey, Voice of	9445eu			
1930-2000	United Kingdom,BBC London	11835af			
1930-2000	Yugoslavia, Radio	6100eu	9720af		
1945-2000	Togo, Radio	5047do			

2000 UTC

2000-2100	Algeria, R Algiers Intl	11715me	15160eu		
2000-2100 vl	Angola, Radio Nacional	9535do			
2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		9580pa	9860pa	11660pa	11695pa
		11855as	11880pa		
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bulgaria, Radio	9700eu	11720eu		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	Canada, RCI Montreal	5995eu	7235eu	11985eu	13650eu
		13670eu	15150eu	15325eu	17820eu
		17870eu			
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	15110af
2000-2100	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2050	Germany, Deutsche Welle	5960eu	7285eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2100	Guatemala, AWR	5980am			
2000-2030	Hungary, Radio Budapest	3955eu	6140eu	7130eu	9835eu
2000-2100	Indonesia, Voice of	9675as			
2000-2030	Iran, VOIRI Tehran	7260af	9022eu		
2000-2030	Israel, Kol Israel	7415na	7465na	9435eu	9845ca
		13750sa			
2000-2015 mtwh/vl	Italy, IRRS Milan	7125va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Lebanon, Wings of Hope	9960va			
2000-2100	Liberia, Radio ELBC	7275do			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710eu			
2000-2010	Mongolia, R Ulan Bator	11790as	12015as		
2000-2100	Netherlands, Radio	4945af	6020af	9605af	9860af
		9895af	11655af	15315af	17605af
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
2000-2100	Nigeria, FRCN/Voice of	7255af			
2000-2050	North Korea, R Pyongyang	6576eu	9345as	9640af	9977as
2000-2100	Russia, Voice of	7230eu	9480eu	9600eu	9755as
		9880eu	11675eu	11730na	
2000-2100	Slovakia, AWR	15620am			
2000-2015	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	6165eu	9770af	9885af	11640af
		13635af			
2000-2030	Turkey, Voice of	9445eu			
2000-2015	Uganda, Radio	4976do	5026do		
2000-2030	United Kingdom,BBC London	9410va	15070va		
2000-2100	United Kingdom,BBC London	3255af	6005af	6180eu	6190af
		6195eu	7160af	7325va	9410va
		9630af	9740au	11750sa	11835va
		11955au	12095va	15070af	17830af
2000-2100	USA, KAIJ Dallas TX	13815am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, Monitor Radio Intl	7510eu	9355eu		
2000-2100	USA, VOA Washington DC	6040va	7375af	7415af	9760va
		9770va	11855af	15205va	15410af
		15445af	15580af	17725af	17755af
		19379va			
2000-2100	USA, WEWN Birmingham AL	7425na	13615na	15375sa	
2000-2100 irreg	USA, WGTG McCaysville GA	7315am	7355am		
2000-2100	USA, WHRI Noblesville IN	9495am	11980am	13760eu	
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRMI/R Miami Intl	9955am			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WVHA Greenbush ME	15745eu			
2000-2100	USA, WWCR Nashville TN	12160am	13845am	15685am	
2000-2030	Vatican State, Vatican R	9645af	11625af	13765af	
2000-2010	Vatican State, Vatican R	4055eu	5885eu	7250eu	
2000-2030	Zambia, Christian Voice	4965af			
2000-2100	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2015-2100 f/vl	Italy, IRRS Milan	7125va			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	11800me			
2030-2100	Armenia, Voice of	11920na	11960na		
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Moldova, R Moldova Intl	11580eu			
2030-2100	Poland, Polish R Warsaw	6095eu	6135eu	7285eu	
2030-2045	Thailand, Radio	9555eu	9655eu	11905eu	
2030-2100	United Kingdom,BBC London	15400eu			
2030-2100	Vietnam, Voice of	7250as	9840eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2050-2100	Vatican State, Vatican R	4055eu	5885eu	7250eu	

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		9580pa	9660pa	11660pa	11855as
		11880pa	11955pa		
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2110	Bahrain, Radio	6010do			
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7235eu	11690eu	13650eu
		13670eu	15150eu	15325eu	17820eu
2100-2200	China, China Radio Intl	6950eu	9920eu		
2100-2130	China, China Radio Intl	15110af			
2100-2200	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2100-2200	Cuba, Radio Havana Cuba	11705eu			
2100-2127	Czech Rep, Radio Prague	5930eu	11640pa		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	6185as	7225af	9670as	9690af
		9765as	11785as	11810af	
2100-2200	Guatemala, AWR	5980am			
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2100-2200 mtwhfvl	Italy, IRRS Milan	7125va			
2100-2200	Japan, NHK/Radio	6035as	7125as	7140as	11850pa
		11865eu			
2100-2115	Japan, NHK/Radio	7190as	7280as		
2100-2110 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Wings of Hope	9960va			
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af		
2100-2200	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2130	Poland, Polish R Warsaw	6095eu	6135eu	7285eu	
2100-2130 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
2100-2200	Romania, R Romania Intl	7195eu	9550eu	9690eu	11940eu
2100-2200	Russia, Voice of	7350eu	7360eu	9480eu	9530af
		9755as	9820eu	11680eu	11750as
		11980eu	12070na	13615as	
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2200	Syria, Radio Damascus	12085eu	15095na		
2100-2110	Uganda, Radio	4976do	5026do		
2100-2200	United Kingdom,BBC London	3255af	3915as	3915as	5975na
		6005af	6180eu	6190af	6195va
		7325va	9410va	9580as	9740va
		11750sa	11835va	11945as	11955va
		12095va			
2100-2130	United Kingdom,BBC London	9630af	15070af	15400eu	
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200 s	USA, KVOH Los Angeles CA	17775am			
2100-2200	USA, KWHR Naalehu HI	15405as			
2100-2200	USA, Monitor Radio Intl	7510na	9355na	13840pa	
2100-2200	USA, VOA Washington DC	6040va	6160va	7375af	7415af
		9535va	9760va	11870va	15185va
		15205va	15410af	15445af	15580af
		17735va	19379va		
2100-2200	USA, WEWN Birmingham AL	7425na	13615na		
2100-2200 irreg	USA, WGTG McCaysville GA	7315am	7355am		
2100-2200	USA, WHRI Noblesville IN	9495am	11980am	13760am	
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200 a	USA, WVHA Greenbush ME	15745eu			
2100-2200	USA, WWCR Nashville TN	12160am	15685am		
2100-2130	Yugoslavia, Radio	6100eu	6185eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom,BBC London	5975ca	15390af	17715ca	
2120-2130 mh	Estonia, Estonian Radio	5925eu			
2130-2200	Australia, Radio	9610as	9645as	15365pa	17860pa
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Iran, VOIRI Tehran	6175au			
2130-2200 as	Latvia, Radio	5935eu			
2130-2200	Liberia, Radio ELWA	4760do			
2130-2200 asmtwh	Moldova, R Dniester Intl	9620na	11750na		
2130-2200	Sweden, Radio	6065eu	7230af		
2145-2200 s	Greece, Voice of	9425au			

2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11660pa	11695pa	11855as	11880pa
		11955pa	13755as	15365pa	17795pa
		17860pa			
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2230	Belgium, R Vlaanderen Int	5910eu	7250eu		
2200-2300	Bulgaria, Radio	9700eu	11720eu		
2200-2300 vl	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960am	9755am	11705as	11895am
		13670am	13740am	15305am	
2200-2230	China, China Radio Intl	3985eu			
2200-2300	China, China Radio Intl	9880eu			
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2200-2300	Cuba, Radio Havana Cuba	6180na	11960na		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2300	Guatemala, AWR	5980am			
2200-2230	Hungary, Radio Budapest	3955eu	5935eu	7250eu	9835eu
2200-2230	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI Tehran	6175au			
2200-2215 as/vl	Italy, IRRS Milan	7125va			
2200-2225	Italy, RAI Rome	9710as	11800as		
2200-2300	Lebanon, Voice of Hope	6280me			
2200-2205	Lithuania, Radio Vilnius	9710eu			
2200-2300	Malaysia, Radio	7295do			
2200-2205	New Zealand, R NZ Intl	11735pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2230 s	Norway, Radio Norway Intl	6170as	6195na		
2200-2300	Russia, Voice of	7360af	9665af	9720af	11730na
		11750as			
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, AWR	11610am			
2200-2230	South Korea, R Korea Intl	5965eu			
2200-2300	Spain, R Exterior Espana	6125eu			
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	5810eu	17750eu	21750eu	
2200-2300	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2200-2300	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6080eu
		6090eu	7240eu	7285eu	9560eu
		11825eu			
2200-2300	United Kingdom,BBC London	6195eu	7110as	7325va	9590va
		9890as	11695au	11750sa	11835af
		11955va			
2200-2230	United Kingdom,BBC London	6180eu	9410va	12095eu	
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	9430as	13840as	
2200-2300	USA, VOA Washington DC	7215va	7340af	7375af	7415af
		9705va	9770va	11760va	15185va
		15290va	15305va	17735va	17820va
2200-2300	USA, WEWN Birmingham AL	7425na	11820sa	13615na	
2200-2300	USA, WHRI Noblesville IN	9495am	13760am	17510am	
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 w	USA, WVHA Greenbush ME	9852eu			
2200-2300	USA, WWCR Nashville TN	9475am	12160am	13845am	
2200-2245	USA, WYFR Okeechobee FL	5810na	9985eu		
2206-2300	New Zealand, R NZ Intl	15115pa			
2230-2300	Austria, R Austria Intl	5945eu	6155eu	9870ca	13730sa
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2240-2250	Greece, Voice of	9425au	9935au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2245-2300	Vatican State, Vatican R	9600au	11830pa		

RADIO NEW ZEALAND INTERNATIONAL
TE REO IRIRANGI O AOTEAROA
O TE MOANA-NUI-A-KIWA
PO BOX 123 WELLINGTON

FREQUENCIES

2300-0000	Australia, Radio	9610as	9660pa	11645as	
		11660pa	11695as	11855as	
		13755as	15365pa		
		17795pa	17860pa		
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000 vl	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Canada, RCI Montreal	5960am	9755am	11940am	
		13670am	15305am		
2300-0000	Costa Rica, AWR Alajuela	5030am	7375am	9725am	
		13750am			
2300-0000	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2300-2305	Croatia, Croatian Radio	5895eu	7370eu	11635eu	
		13830eu			
2300-0000	Egypt, Radio Cairo	9900na			
2300-2350	Germany, Deutsche Welle	6000as	6160as	7150as	
2300-0000	Guam, AWR/KSDA	11980as			
2300-0000	Guatemala, AWR	5980am			
2300-0000	India, All India Radio	9705as	9950as	11745as	
		13750as	15145as		
2300-0000 f/vl	Italy, IRRS Milan	7125va			
2300-0000	Japan, NHK/Radio	6055eu	6155eu	7125as	
		7140as	11850pa		
2300-0000	Lebanon, Wings of Hope	9960va			
2300-0000	Malaysia, Radio	7295do			
2300-0000	New Zealand, R NZ Intl	15115pa			
2300-2305	Nigeria, FRCN/Radio	3326do	4990do		
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-0000	Russia, Voice of	7125na	9665na	9720af	
		11730na	11750na		
2300-2317	Sierra Leone, SLBS	3316do			
2300-0000	Slovakia, AWR	9965eu			
2300-0000	Turkey, Voice of	7190na	7280eu	9560as	
2300-0000	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195va	
		7110as	7250as	7325va	
		9580as	9590va	11750sa	
		11945as	11955va		
2300-2330	United Kingdom,BBC London	3915as	11835eu		
2300-2330	USA, KAIJ Dallas TX	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	7510eu	9430as	13625pa	
		13770sa			
2300-0000	USA, VOA Washington DC	7215va	7340af	7375af	7415af
		9705va	9770va	11760va	
		15185va	15290va	15305va	
		17735va	17820va		
2300-0000	USA, WEWN Birmingham AL	7425na	13615na		
2300-0000	USA, WHRI Noblesville IN	5745am	17510am		
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 w	USA, WVHA Greenbush ME	9852eu			
2300-0000	USA, WWCR Nashville TN	5065am	9475am	13845am	
2330-0000	Australia, Radio	9645as	9850as	13605as	
		15240pa			
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000	Palau, KHBN/Voice of Hope	15140as			
2330-0000	Vietnam, Voice of	7250eu	9840eu	15010eu	
2335-2345	Greece, Voice of	9935sa	11595sa	11640sa	
		11645sa			

SELECTED PROGRAMS

Sundays

2310 UK, BBC London (af): BBC English (Voice Box). See S 1530.
2310 UK, BBC London (am/as pac): East Asia Today. News, analysis, press reviews and reports from BBC correspondents.
2310 UK, BBC London (eu): BBC English (Voice Box). See S 1530.
2330 UK, BBC London (am): Short Story. See S 0430.
2330 UK, BBC London (as pac): Letter from America. See S 0030.
2345 UK, BBC London (am/as pac): Write On. See S 0145.
2355 UK, BBC London (am): Words of Faith. See S 0555.
2355 UK, BBC London (as pac): Book Choice. See S 1525.

Mondays

2310 UK, BBC London (af): Take Five. See M 0410.
2310 UK, BBC London (am/as pac): East Asia Today. See S 2310.
2310 UK, BBC London (eu): Take Five. See M 0410.
2330 UK, BBC London (am): Outlook. See M 1405.
2330 UK, BBC London (as pac): The World Today. See M 1630.
2345 UK, BBC London (as pac): Waveguide. See S 0350.
2355 UK, BBC London (am): Words of Faith. See S 0555.
2355 UK, BBC London (as pac): Take Five. See M 0410.

Tuesdays

2310 UK, BBC London (af): Encore. See S 0435.
2310 UK, BBC London (am/as pac): East Asia Today. See S 2310.
2310 UK, BBC London (eu): An A-Z of Composers. Life-stories of some of the lesser known composers.
2330 UK, BBC London (am): Outlook. See M 1405.
2330 UK, BBC London (as pac): The World Today. See M 1630.
2345 UK, BBC London (as pac): Development '95. See M 0530.
2355 UK, BBC London (am): Words of Faith. See S 0555.

Wednesdays

2310 UK, BBC London (af): Pop Short. See T 0410.
2310 UK, BBC London (am/as pac): East Asia Today. See S 2310.
2310 UK, BBC London (eu): Variable Feature. See S 0005.
2330 UK, BBC London (am): Outlook. See M 1405.
2330 UK, BBC London (as pac): The World Today. See M 1630.
2345 UK, BBC London (as pac): From Our Own Correspondent. See S 0130.
2355 UK, BBC London (am): Words of Faith. See S 0555.

Thursdays

2310 UK, BBC London (af): Take Five. See M 0410.
2310 UK, BBC London (am/as pac): East Asia Today. See S 2310.
2310 UK, BBC London (eu): Take Five. See M 0410.
2330 UK, BBC London (am): Outlook. See M 1405.
2330 UK, BBC London (as pac): The World Today. See M 1630.
2345 UK, BBC London (as pac): The Farming World. See M 0015.
2355 UK, BBC London (am): Words of Faith. See S 0555.

Fridays

2310 UK, BBC London (af/eu): Variable Feature. See S 0005.
2310 UK, BBC London (am/as pac): East Asia Today. See S 2310.
2330 UK, BBC London (am): Outlook. See M 1405.
2330 UK, BBC London (as pac): The World Today. See M 1630.
2345 UK, BBC London (as pac): Short Story. See S 0430.
2355 UK, BBC London (am): Words of Faith. See S 0555.

Saturdays

2300 UK, BBC London (af/am/eu): Play of the Week (from 2230). See S 1130.
2310 UK, BBC London (as pac): From Our Own Correspondent. See S 0130.
2330 UK, BBC London (am): The Ed Stewart Show. See S 0230.
2330 UK, BBC London (as pac): From Hoplite to Harrier. See M 0630.
2330 UK, BBC London (eu): Jazz Now and Then. See W 1130.

HAUSER'S HIGHLIGHTS

ISRAEL: KOL ISRAEL 3 SEPT TO 2 MARCH:

English
0500-0515 5895, 17545
2000-2030 7415, 7465, 9435, 9845, 13750

Other languages continue: French, Spanish, Persian, Yiddish, Romanian, Bucharian, Georgian, Ladino, Yemenite, Tatian, Russian;

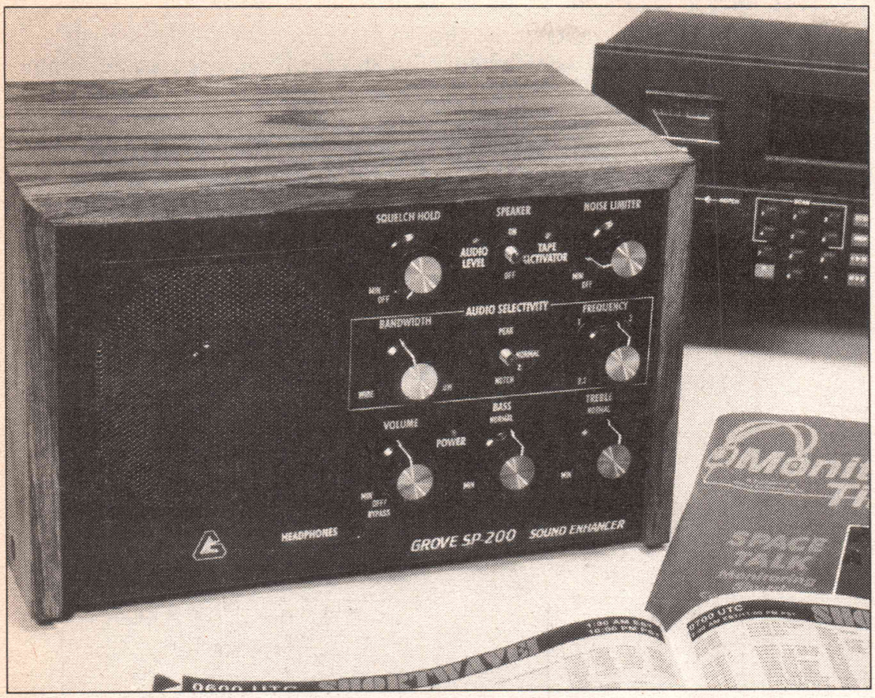
Arabic:
0400-2230 5915, 9815, 15480

Hebrew Bet network:
0400-0700 9390
0700-1430 17545
0700-1500 13755
0700-1600 11590
1200-1400 15615
1630-2400 7495
1700-2300 9390
0000-0630 7495
1000-1200 13615
(Sat 0800-0900)
(IBA via Steven Cline)

Your Name in Lights!

… or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Your QSLs will be returned.

Price Reduction on the Grove SP-200A!



Don't miss this opportunity to own the most revolutionary audio accessory on the market for shortwave and scanner listeners—now reduced in price by over 28%! Grove's new and improved **SP-200A Sound Enhancer** is really six products in one. Just look at its many features and capabilities:

- **Top quality speaker**
- **Hand-crafted solid oak cabinet**
- **Adjustable notch/peak filter**
- **Recorder activator**
- **Audio amplifier**
- **Audio activated squelch**
- **Noise limiter**

Grove Christmas Special:

Save $79^{00} off regular price of $279^{95}

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Why pay over $400 for separate audio components for your listening post—such as a speaker, adjustable notch/peak filter, audio amplifier, bass and treble equalizers, audio squelch, recorder activator and noise limiter—when you can have them all in one attractively styled solid oak cabinet! This quality accessory is guaranteed to improve reception on any receiver, scanner or transceiver.

Peak desired signals while reducing or even eliminating interference. Ideal for voice, music, CW or data. Equipped with stereo-mono headphone jack for privacy. Heavy-duty AC power supply is included at no extra charge!

The cabinet is hand-crafted in the mountains of North Carolina. Textured metal front panel resists fingerprints.

SPECIFICATIONS:

Power required: 12 to 14 VDC @500 mA; 120 VAC adaptor included
Audio power output: 2.5 W @ 10% THD (8 ohms)
Audio selectivity: Peak/notch 30 dB or greater, 0.3-6 kHz
Squelch hold: 0-10 seconds
Noise limiter: Adjustable-threshold pulse noise clamp
Tape activator: Audio activated (VOX), 3 second hold
Tape output: 55- mV P-P @ 600 ohms (nom.)
Headphone jack: Universal mono-wired stereo jack
Dimensions: 10-7/8"W x 6-7/8"H x 7-1/4"D

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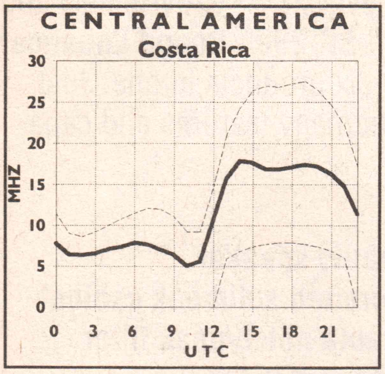
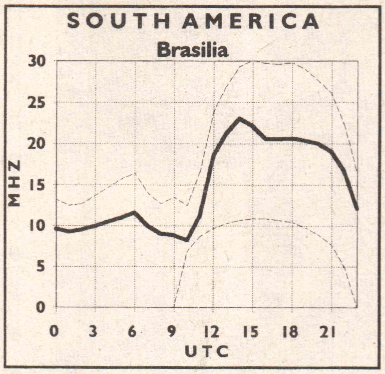
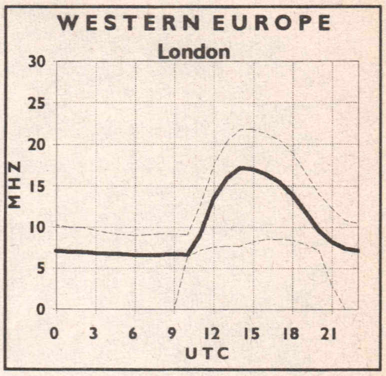
Brasstown, NC 28902

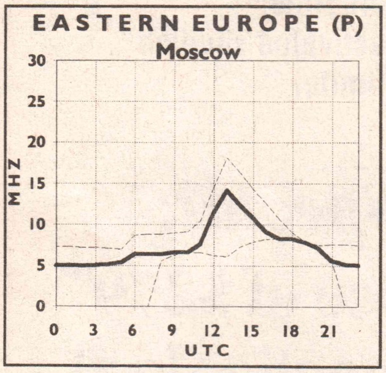
Propagation conditions: Eastern United States

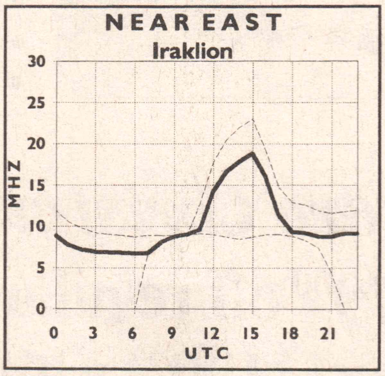
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 6.

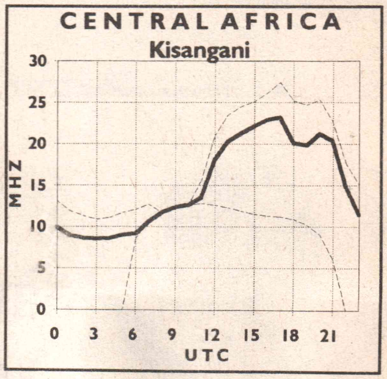

CENTRAL AMERICA
Costa Rica

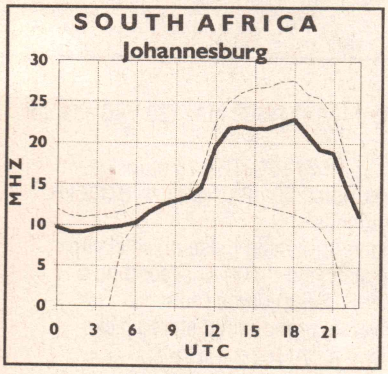

SOUTH AMERICA
Brasilia

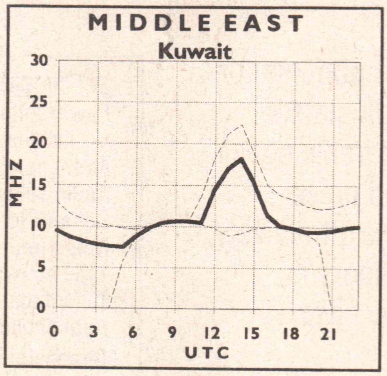

WESTERN EUROPE
London

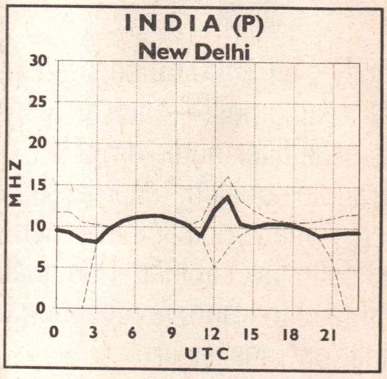

EASTERN EUROPE (P)
Moscow

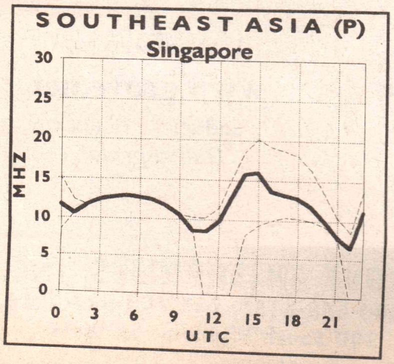

NEAR EAST
Iraklion

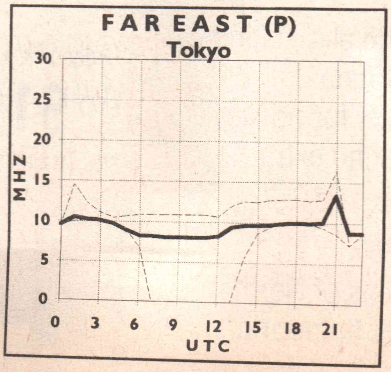

CENTRAL AFRICA
Kisangani

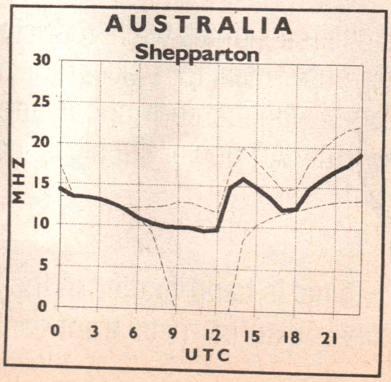

SOUTH AFRICA
Johannesburg


MIDDLE EAST
Kuwait


INDIA (P)
New Delhi

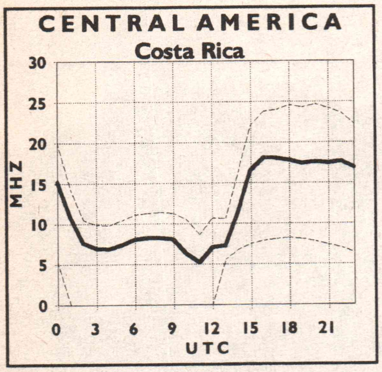

SOUTHEAST ASIA (P)
Singapore

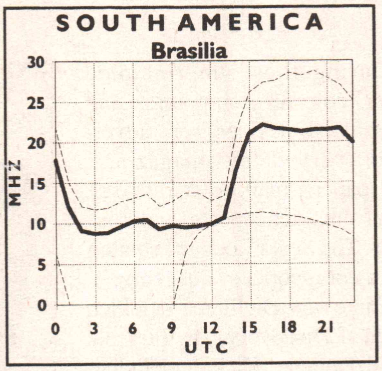

FAR EAST (P)
Tokyo

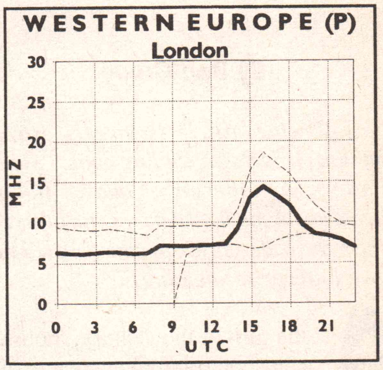

AUSTRALIA
Shepparton

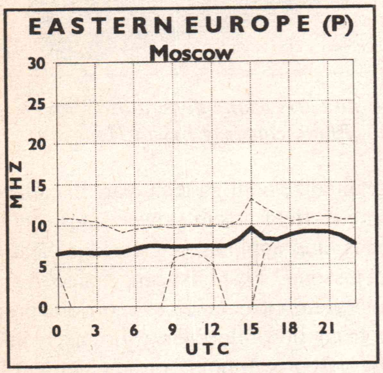
Propagation Conditions: Western United States

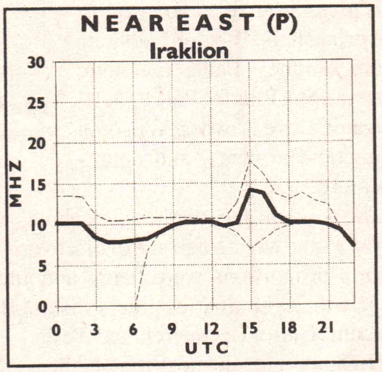
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

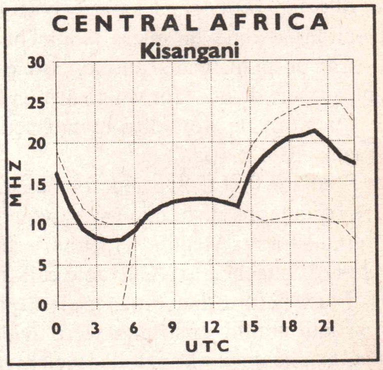

CENTRAL AMERICA
Costa Rica

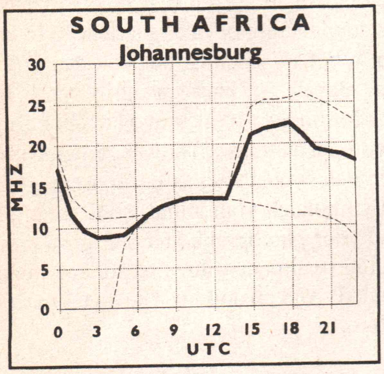

SOUTH AMERICA
Brasilia

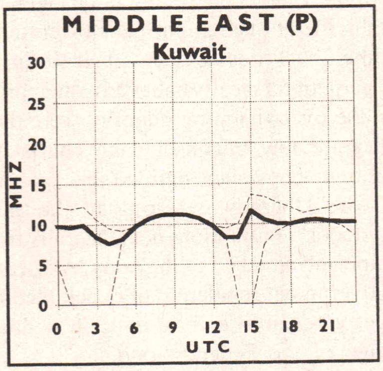

WESTERN EUROPE (P)
London

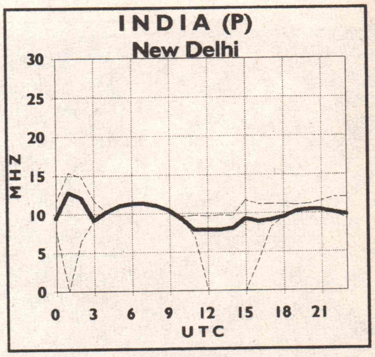

EASTERN EUROPE (P)
Moscow

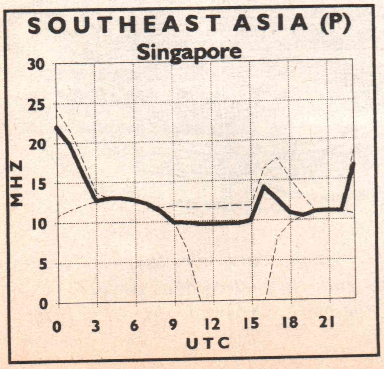

NEAR EAST (P)
Iraklion

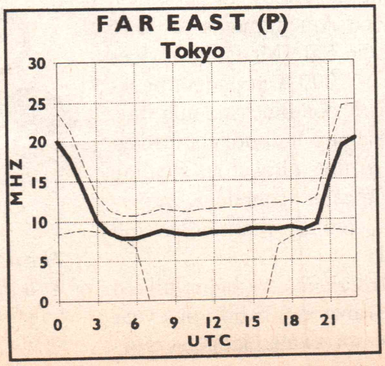

CENTRAL AFRICA
Kisangani

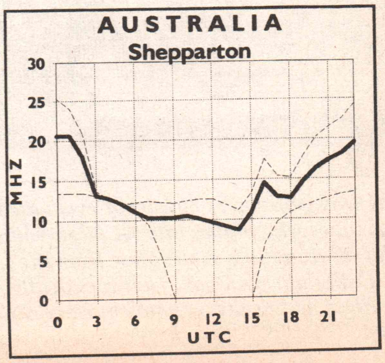

SOUTH AFRICA
Johannesburg


MIDDLE EAST (P)
Kuwait


INDIA (P)
New Delhi


SOUTHEAST ASIA (P)
Singapore


FAR EAST (P)
Tokyo


AUSTRALIA
Shepparton

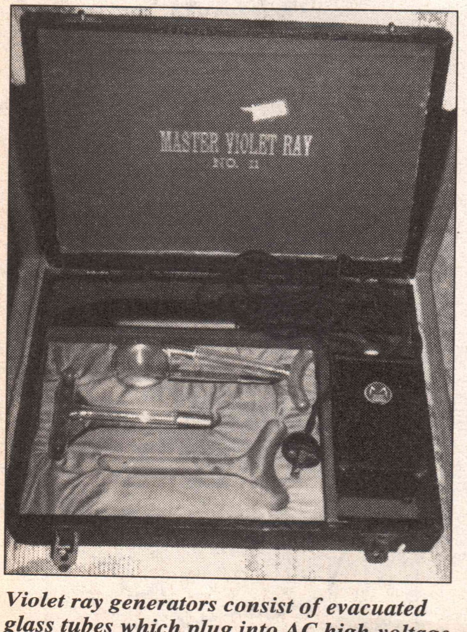
Medical Quackery: The Early Years

By Bob Grove

(The following article is largely extracted from Bob Grove's impending book, "Medical Quackery: A Collector's Guide." Bob also collects quack medical devices and takes some of them as trade-ins for products listed in the Grove Enterprises catalog)

At the turn of the century, thousands of pitchmen (and pitchwomen!) were pronouncing the miraculous properties of patent (but not necessarily patented) concoctions—some harmless, some harmful—to an unsophisticated public. To a lesser extent, strange devices for which astounding claims were made were also brandished by the quacks. But it wasn't new.

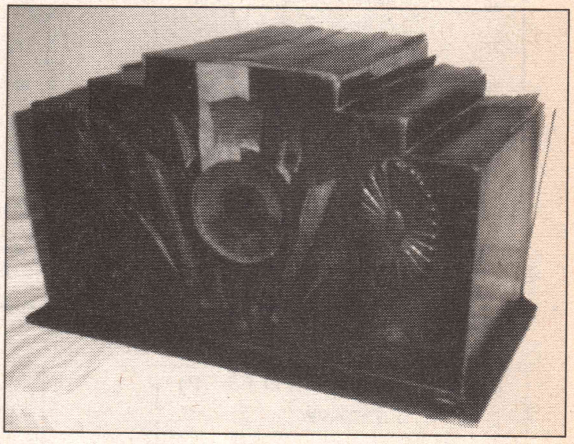
In 1796, the first U.S. patent for a medical device of dubious distinction was issued to Dr. Perkins for his Metallic Tractors, a set of metal prods attached to a Galvanic cell (battery). Even before that time, useless pills, salves, and liquid nostrums were widely hawked by pitchmen who extolled their mythical virtues.



Violet ray generators consist of evacuated glass tubes which plug into AC high-voltage coils, resulting in a violet glow from the remaining nitrogen gas. Therapeutically worthless, but pretty. (Photo courtesy Alf Raits)

During those unprincipled years, colorful compounds and imaginative devices were advertised everywhere—magazines, newspapers, mail order catalogs, storefronts, fenceposts, and barn roofs. The Sears Roebuck catalog was a cornucopia of quackery.

There were Dr. Pierce's Golden Medical Discovery, Dr. Pierce's Nasal Douche, Kickapoo Indian Medicine Company's Sagwa, Dr. Hercules Sanche's Oxydonor, Pulvermachers' Electro-Galvanic Chain, Kidney Pads, magnetic plasters, Pink Pills for Pale People, Galvanic Love Powder, Wilsonia Magnetic Garments, and countless more.



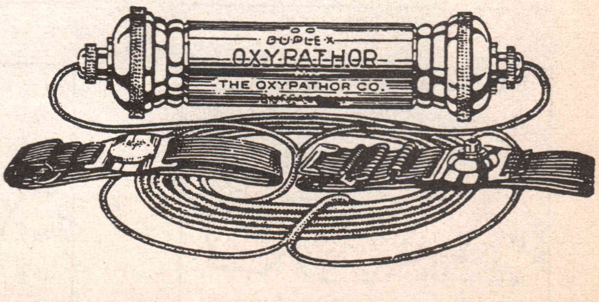
The Fanozone is an early ozone generator ("fan" + "ozone"; get it?) (Photo courtesy Bryan Hodgson)

The golden age of these machines was during a time when a barrage of discoveries of historic proportions were being announced by scientific luminaries like Edison, Bell, Marconi, Curie, Becquerel, and Tesla.

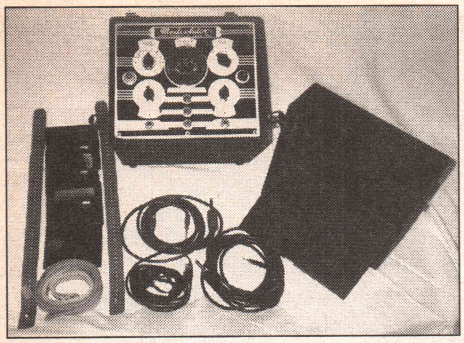
High noon for the nostrum peddlers came on January 1st, 1907; with the passage into law of the 1906 Federal Pure Food and Drug Act, this illegitimate empire began to crumble. But the quack devices continued to thrive. Few perpetrators really believed in their products; the overwhelming majority were then, as they are now, unconscionable charlatans. Legitimate physicians derided this "gaspipe and wire" therapy, referring to the early "Oxydonor" contraptions made literally from gaspipe and attached to the body by wires.

Government regulation of quack medical gadgetry began in earnest in 1938 with the passage of the Federal Food, Drug, and Cosmetic Act; it was strengthened by the Medical Device Amendments of 1976 and the Safe Medical Devices Act of 1990. But gadget hucksterism continues to this day, with many individuals testifying to the miraculous healing they receive from devices, persons, icons, chemicals, and foods.

Americans are being bilked an estimated $25 billion a year by health scams. Gadgeteers often capitalize on high tech fears like electromagnetic fields from power lines, cellular phones, and appliances. Consider these ads from just one 1995 holistic magazine: A small amulet claims to balance, support, and protect you from invisible energy drains, while a diode purports to hold you in electrical balance; naturally, both claim to be used by doctors. For $43.90 you can receive a needleless acupuncture device, guaranteed to bring pain relief in seconds, but you can buy the same device—a barbecue grill spark ignitor—for under $10 at Wal-Mart. For a mere $8 you can purchase a shower curtain clip that assimilates your thought-sensitive energy field and stimulates your mind, soul, and spirit. Send your photograph and $45 for a remote healing treatment—three treatments recommended! And on and on. The quacks are still with us.



The derisive term, "gaspipe and wire therapy" originated with these useless gadgets portrayed as oxygen rejuvenators for the body, and made, literally, from gaspipe and wire.

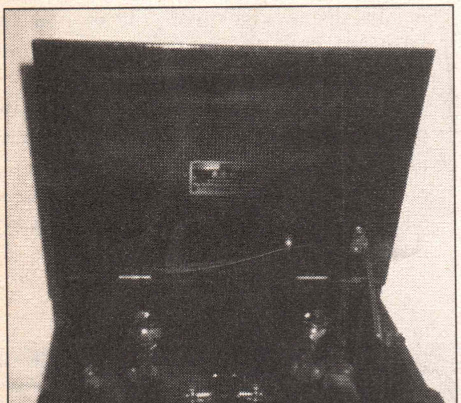


The Medcolator features a surplus 1619 "cat's eye" tube for a little pizzaz. (Photo courtesy Bryan Hodgson)

Don't Be Fooled!

So when is the treatment quackery? According to the FDA, if it is worthless or dangerous. For example, while Davis and Kidder's "Magneto Electric Machine" was for treating nervous disorders, the patient (victim?) was probably a lot more nervous after getting zapped! In any case, these devices didn't live up to their claims.

No singular treatment (panacea) is effective for a wide range of afflictions. Massagers, external suction devices, saunas and sweat devices, and other gadgets cannot take off weight or fat without dieting or exercise. Vibrators cannot cure arthritis, rheumatism, nervous disorders, heart conditions, or other serious diseases. Breast enlargers don't work; in fact, they can cause the spreading of cancer cells if present. Home air purifiers, vacuum cleaners, and negative ion generators cannot prevent or treat allergies, colds or other diseases. "Secret" treatments are fakes. Product endorsements are meaningless.

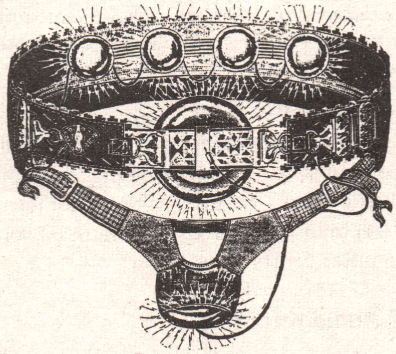


The two-tube RDK impressed its patients with red, blue, and green lights as well. (Photo courtesy Bryan Hodgson)

If you have a question about a specific medical device, treatment or compound, contact your nearest FDA office.

Collecting

The most common quack medical gadgetry of the old genre still to be found are the violet ray generators of the 1920s and '30s and the turn-of-the-century faradic batteries (induction coil shock machines). The violet ray machines are usually in a black leatherette carrying case and consist of a cylindrical "wand" and several plug-in glass tubes of various shapes. The faradic batteries consist of a vibrating-contact induction coil housed in a wood carrying case with a pair of insulated lead wires connected to metal discs, cylinders, or plates to be attached to the patient.



The miraculous "Heidelberg Electric Belt" was sold widely by Sears Roebuck. (Illustration from early Sears Roebuck catalog.)

Quack medical machinery is often encountered at hamfests, antique radio flea markets, public flea markets, and even auctions. Appraising the values of these devices is difficult since there is no organized collectors' society, nor have any books previously been written extensively cataloging these intriguing devices.

Violet ray generators and faradic batteries typically sell for $25-50, depending upon condition, accessories, seller's knowledge, and what the market will bear. More elaborate devices may be worth $1000 or more, while simpler gadgets may bring only a few dollars. It's a tricky market with no rules.

Hopefully my new book, due for publication within the next few months and listing approximately 200 of these classic contraptions, will help define this fascinating era of medical quackery.

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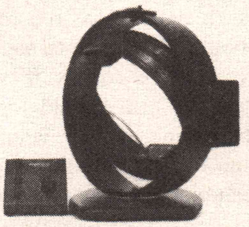

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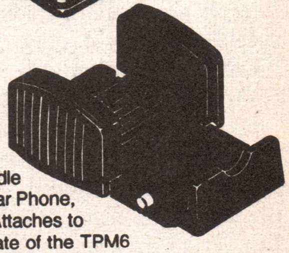

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THE WORLD OF DOMESTIC BROADCASTING

Doug Smith, W9WI

Recording your DX

People love to record the milestones and achievements of their lives. You can't possibly visit a tourist attraction, a wedding, or a home with a baby in it, without encountering cameras and camcorders. Of course, DXers are people too, (though their friends and spouses may occasionally disagree) and often develop the urge to record their DX accomplishments for posterity and bragging rights.

The most basic method of DX recording is the log book. As domestic-band DXing isn't a competitive activity, there are no rules for what you should log. Callsign, frequency, time, and date would be obvious minimum items. Most DXers also log some programming details and a signal report.

I actually maintain two logbooks. One is simply a spiral-bound, school notebook. I write in details of each logging freehand, wherever it fits on the page. A second log (which I actually keep on a computer) just tracks time, date, call letters, frequency, city, and state. This log is easier to read, and can be more easily sorted if I want to know how many Illinois stations I've heard, for example.

Spiral-bound, school notebooks work quite well for both kinds of log. Ruled, three-hole, composition paper also works well and has the advantage of almost unlimited expansion in a three-ring binder—you'll never fill the log. Some DXers might consider this a negative feature; filling that last page and opening a new log can be quite a milestone! Already-printed shortwave DX logbooks also work fine. Or, the National Radio Club offers log sheets especially designed for AM DXers. (Send a 32-cent stamp to Box 164, Mannsville NY 13661 for a catalog of NRC supplies.)

Computers are a natural for logging. No special software is required; a regular spreadsheet like the one included in Microsoft Works (included with many new PCs) works fine. Just set up the columns according to your tastes, and set the format of each column to match the type of data (time, date, text, etc.). With a computerized log, it's a trivial task to sort your DX by state, by frequency, by time/date, or whatever.

If you intend to use the computer *while* DXing, rather than for entering data after receiving the DX, make sure the computer is electronically quiet. Use only shielded cables, keep your antenna and feedline away from the computer, and consider buying a handful of ferrite cores (Radio Shack part number 273-104) to install on your keyboard, power, and monitor cables.

WLIM-1580 uses this studio and office facility on Long Island. Note the very short tower atop the building; this supports a studio-transmitter link antenna to deliver WLIM's audio to their transmitter site.

■ Audio recording

The next step for most DXers is audio recording. If you use your stereo system for DXing, this is easy; just select "AM" or "FM" mode, turn "Tape Monitor" on, put a cassette in your tape deck and press "Record." In most cases, however, the AM tuner in your stereo isn't much good for DX, and you'll be using a G.E. SuperRadio, or a communications receiver like the Drake R-8, or some other radio.

If your aim is to record DX, a high-fidelity tape recorder isn't necessary. Small portable cassette recorders, like the ones you may have used in foreign-language classes in school, are just fine. You'll want two accessories. If the recorder doesn't already have it, you should buy an AC adaptor. You'll probably record five minutes of static and interference for every minute of clear identifiable material you get on tape, so you'll wear down a set of batteries *fast*!

Second, you should get an attenuating patch cord, with the appropriate adapters or connectors to go from the earphone jack on your radio to the microphone jack on the tape recorder. This knocks down the very loud audio on the earphone jack to a level the recorder's sensitive microphone input can handle. Don't try just holding the recorder's microphone in front of the radio's speaker. It'll work, but you'll be disappointed with the results.

Here's a sneaky technique used by some serious DXers—use a *video* tape recorder to record your *radio* DX. If you've been following the DX Tests, reported in *MT* during the fall and winter months, you've noticed they provide a chance to log exotic stations. They also require you to stay awake to some exotic hours of the morning. But, if you use a VCR, you can program it to come on automatically when the test is scheduled to begin. As an added bonus, you can record up to six hours of audio, so you can catch whatever other exotic DX may pop up on the frequency after the test is over.

To set this up, you'll need an audio cable with appropriate adapters to connect the earphone jack on your radio to the audio input jack on your VCR. On most VCRs, plugging something into the audio input jack automatically disconnects the tuner's audio.

Most VCRs won't record audio properly unless there's also video to record. If you have cable, this can be handy. Punch up a program guide channel or some other channel that displays the time. Your six-hour DX tape is now automatically tagged with the correct time of each logging.

Be sure to test the arrangement manually before preparing to record anything important. No two VCRs work alike, and the generic setup instructions above may not work on some models. If in doubt, check the owner's manual.

B-103 Long Island's Oldies
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DUNKIN DONUTS
Allstate 968-9500

"B-103" is WBZO, 103.1FM. It looks like the morning DJs don't have far to go for their sugar fix!

SKIPPING IN

This month's FM DX is from Charles Bernth of Eastport, New York—his first FM DX, but I suspect not his last.

WRMF-97.9	Palm Beach, FL
WPEG-97.9	Concord, NC
WGNE-98.1	Titusville, FL
WLRQ-99.3	Cocoa, FL

Charles also sent the Long Island photos appearing in this month's column.
Send your DX loggings—AM and TV, too—to me at Box 98, Brasstown, NC 28902

Recording TV DX

This is almost trivial. Almost every home has at least one VCR, and you can record your TV DX the same way you record the local stations. If you normally use your VCR only with cable, make sure your antenna is connected to the VCR properly. Some older VCRs have separate antenna inputs for UHF; if you intend to record UHF DX, make sure your UHF antenna is connected properly.

VCRs require a relatively stable picture to record. Some weaker DX, or DX in heavy interference, may simply be impossible to record. If interference is the problem, try turning your antenna *away* from the DX. Sometimes this will allow the closer-in station to provide the synchronizing signals to stabilize your VCR, while still allowing the DX to be seen as weak interference.

Other DXers photograph the TV screen during DX reception. Use a shutter speed of 1/30 second. This is the time required for the picture tube to "paint" one picture on the screen. Faster speeds may only capture part of the picture; slower speeds may blur too much. Personally, I've never had much luck with TV photography. If you've successfully photographed your TV DX, please let me know how you did it.

Bits & Pieces

- Brian Rogers in Allen Park, Michigan, forwarded a Detroit *Free Press* article about a unique radio station in Detroit, WNZK-AM. The point of the article was WNZK's unique programming; it broadcasts in 13 languages, including Arabic, Serbian, and Albanian. But WNZK is unique in another way: it uses 690 kHz during the day, and switches to 680 kHz at sunset! To my knowledge, no previous U.S. station has used two different frequencies, though two in Canada did so until the early 1990s.
- There isn't much activity yet in the new 1600-1700 kHz expanded AM band. Many broadcasters were unhappy with the FCC's proposed allocations, and the Commission is reconsidering their action.

In the meantime, the Army is preparing to make use of the band. Gary Timm of Milwaukee sent a note from the publication *Radio World* noting that the U.S. Army will be testing its "Mobile Radio Station" on 1670 kHz. Tests will run for a week, (*Which week? The article doesn't say.*) and reports from DXers would be appreciated. As with the digital radio tests in Las Vegas earlier this year, DXers should expect to hear this station anywhere in North America. Keep checking 1670, and let me know if you hear anything!

As always, I want to hear from you. Write to Box 98, Brasstown NC 28902, or by E-mail to 72777.3143@compuserve.com. Good DX!

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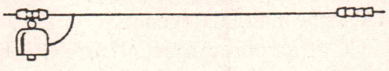

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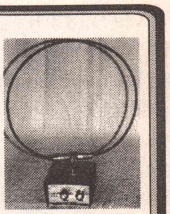
shown with NSW-130 Loop

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FEDERAL FILE

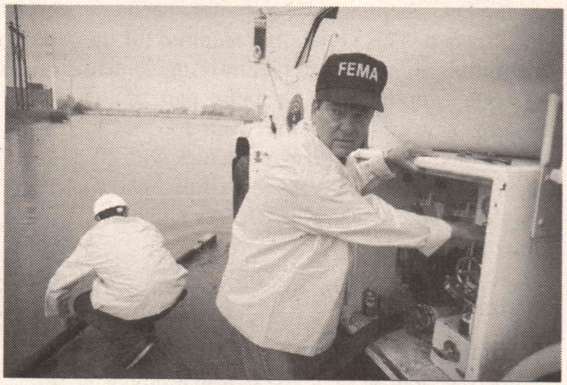
A GUIDE TO GOVERNMENT COMMUNICATIONS

John Fulford, WA4VPY

SWLing the Feds

No sooner did hurricane Luis blast his way through the Caribbean Islands, than his sister Marilyn followed hot on his heels to ravage the United States Virgin Islands. Our hearts go out to the residents of this devastated area.

The Governor of the U.S. Virgin Islands declared a dusk-to-dawn curfew to discourage the looting we saw on the CNN evening news. The National Guard was called out to supplement the existing government, and President Clinton sent several hundred FBI agents and deputy U.S. Marshalls to the area to provide federal assistance.


In a disaster listen for federal frequencies on Shortwave.

I swung the monitoring beam southeast from my South Florida location and tried to monitor any traffic coming out of the area. Obviously VHF and UHF communications were out of the question, but I was hoping for some 30-88 MHz traffic. Nothing was heard there either.

Why did I try 30-88 MHz and not 30-50 MHz? Remember that the National Guard had been deployed. If you have been following this column, you will remember that the military uses 30-88 MHz for their tactical traffic. The military and some quasi-civilian agencies use PRC/77 backpack units along with their mobile/base equivalents. Be careful: These transmissions occupy a fairly wide band, so some of the "tight" professional scanners will overlook these 15/20 kHz bandwidth transmissions. However, I have heard a lot of weekend traffic in the 30-40 MHz range, especially in the 30/31 MHz range.

Did I hear any traffic? Well, no. The gods of propagation were not kind to me. I monitored a lot of marine band traffic in the 4/6/8 MHz bands coming out of the affected area, including one coastal station at a fish processing plant in Pompano Beach, Fla., which was apparently the only communications link remaining directly after the storm.

Shortwave Back-Up Systems

What does this have to do with Federal monitoring? Well, it's notable that in these days of satellite communications, digitally scrambled cellular systems, and newly-installed federal trunking systems, the only transmission medium that was working following the hurricane was on shortwave. Wisely, in setting up redundant, communications back-up systems, the Federal government has allocated numerous shortwave frequencies for their use in an emergency.

If you ever think to visually examine federal facilities, such as a major post office, you will see high frequency antennas sprouting up everywhere. These are part of the SHARES program, which is the Federal government, shared radio program. You will hear nearly all federal agencies participating when they have their semi-annual tests—from the FBI, to FEMA, to the Internal Revenue Service. I was at an FCC office during a recent SHARES test and it was amazing to hear the number of agencies checking in that you wouldn't expect to be participating.

The SHARES program was highlighted by Larry Van Horn as recently as his March 1994 Utility World column, so I won't dwell specifically on this program. What we will look at this month is the Federal use of the shortwave spectrum.

Dept of Justice

On close examination, you will observe that some of the same frequencies appear to be used by different agencies, such as DEA and FBI, but remember that both agencies are part of the Department of Justice.

The Federal Bureau of Investigation has operated a high frequency backup network for years. When I was growing up (a long time ago), I used to visit Miami with my parents to visit an uncle. I always looked forward to the trip down I-95, where there was a ten second "window" during which you could see the roof of the FBI building on Biscayne Blvd. in downtown Miami. There were high frequency whips dotting the roof, along with the 406/420 MHz link antennas. That building has since been abandoned, but the new FBI office still has the new generation of high frequency antennas on its roof.

FBI frequencies in use are:

5.0585 7.9035 9.3115
10.4985 12.1385 14.4935
15.9535 16.3760 17.4035
18.6660 20.3485

The net is tested every Monday morning at 0900 hrs local time. The equipment is a Harris 1 kW desktop upright station with automatic link establishment and voice/data encryption.

Southern net control is Atlanta, call sign KIG67. The western net control is Las Vegas, call sign KOG55.

Another branch of the Department of Justice is the Drug Enforcement Administration. They operate two high frequency systems. The first is their ***DEA Over the Horizon Radio System:***

Ch.	Freq	Callsign	Location
A	5.2770	ALMIGHTY	GUANTANAMO BAY
B	5.8410	AMBUSH	DOD JTF4 DOMINICAN REP
C	7.3000	ATLAS	C3I CENTER ELPASO
D	9.4970	AZURE	DEA OPS BERMUDA
E	11.0760	BLUEGILL	300 COAST GUARD
F	7.6570	CONDOR	DEA TURKS & CAICOS
G	14.6900	FLINT	DEA AIR ASSET OPNS
H	18.6660	FLINT BASE	DEA AIR OPNS BASE
I	23.6750	HAT TRICK	DEA RADAR DOM. REP.
L	14.3500	JAGUAR	DEA COLOMBIA
P	14.6860	LANDSHARK	COAST GUARD OPNS MIAMI
R	23.4025	MARLIN	COAST GUARD C3I MIAMI
SI	18.1710	OMAHA	ANY FEDERAL AIRCRAFT
SJ	19.1310	PANTHER	DEA BAHAMAS

Any callsign can be heard on any channel.

The second high frequency group is a ***Department of Defense Channel Group:***

Channel	Frequency
XA	2.8085
XB	4.9910
XC	5.0585
XD	7.7785
XE	9.2385
XF	11.1910
XG	15.9535
XH	17.6010
XI	19.1310

US Customs

To assist the above agencies in their war on drugs, the United States Customs Service operates an extensive high frequency network. They operate a ten channel, automatic link establishment, which is a Rockwell/Collins ARC-207 system. This system is called ***COTHERNS (Customs Over The Horizon Radio System):***

Chan	Freq	Use
VA	27.8700	SIMPLEX UNLESS NOTED
VB	20.6310	
VC	18.5940	SCAN CHANNEL 7
VD	17.4750	
VE	10.2420	SCAN CHANNEL 3
VF	11.4940	SCAN CHANNEL 4
VG	13.9070	SCAN CHANNEL 5
XA	*XRay Channels same as DEA freqs.*	
YA	3.4280	
YB	5.5710	
YC	8.9120	SCAN CHANNEL 2
YD	11.2880	
YE	13.3120	
YF	17.9520	
YG	20.8900	SCAN CHANNEL 8
YH	23.2140	SCAN CHANNEL 10
YI	25.3500	SCAN CHANNEL 10
ZA	4.5000	
ZB	7.5270	SCAN CHANNEL 1
ZC	9.8020	
ZD	12.2220	
ZE	15.9670	SCAN CHANNEL 6

If you have a receiver with scanning capability, you can program in the scanning channels 1-10 and listen for the link establishment equipment in operation. It is also a great way to keep check on propagation.

The frequency of 7527 kHz carries an interesting variety of communications. I have heard cryptic two-way Spanish conversations along with the Customs ALE system. Numbers stations have also been heard on this channel. Keep your ear on it for interesting listening.

FAA

One frequent check-in to the SHARES program and a frequent user of the high frequency spectrum is the Federal Aviation Administration. They also operate an over-the-horizon system with automatic link establishment This system is known as ***NARACS (National Radio Communications System):***

Chan	Frequency	Use
00	4.6750	SCAN CHANNEL 1
01	6.8700	SCAN CHANNEL 2
02	7.6110	NON SCAN
03	7.4750	SCAN CHANNEL 3
04	8.1250	SCAN CHANNEL 4
05	9.9140	SCAN CHANNEL 5
06	11.6370	NON SCAN
07	13.4570	SCAN CHANNEL 6
08	15.8510	SCAN CHANNEL 7
09	16.3480	SCAN CHANNEL 8
10	19.4100	SCAN CHANNEL 9
11	20.8520	SCAN CHANNEL 10
12	3.4280	AERON. SIMPLEX
13	5.5120	SAME
14	8.9120	SAME
15	11.2880	SAME
16	13.3120	SAME
17	17.9520	SAME
18	10.4930	EMERGENCY

Net control is KDM50 in Hampton, Ga.

FEMA

Once an emergency situation has passed, the Federal Emergency Management Agency (FEMA) will generally move in one of their Multi-Agency Radio vehicles. These are tractor trailer units, of which there are five nationwide. It can travel 800 miles before needing refueling, and is delivered in the belly of a C5-A cargo plane.

The equipment makeup of one of these vehicles includes the following:

1. Redundant 25KVA alternators
2. Environmental system good for -25C to +60 C
3. Three Harris RF 350K 500 watt autotune 1.6 to 29.9999 MHz transceivers
4. Motorola MCX-1000 VHF repeater with PL, DPL, and digital encryption
5. Motorola Spectra UHF repeater with PL, DPL, and encryption
6. Motorola SPECTRA 800/900 repeater—conventional and trunked
7. Four Magnavox VRC-83 HF/VHF/UHF multimode aircraft radios
8. Magnavox URC-110 FLTSATCOM Terminal
9. Ku band video uplink
10. Numerous 138 MHz SABER VHF handheld radios

This system allows up to six, bent pipe repeaters, simultaneously, to allow government agencies with otherwise incompatible radios and frequencies to communicate with each other.

The FEMA representative this writer talked with indicated that their greatest weakness was not having a MODAT (Motorola VHF/UHF mobile data terminal—similar to that in some police cars), packet, and HF SITOR modes. Their only data system was a Baudot RTTY terminal.

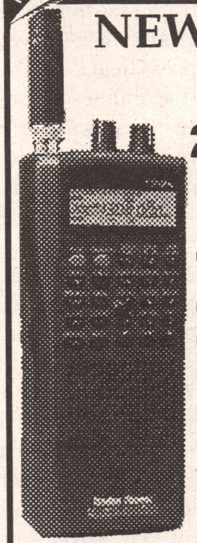
The following frequencies are generally in use by the *FEMA* van:

138.400 MHz	carrier squelch
138.575 MHz	p/l is 118.8 Hz
139.825 MHz	receive/148.575 MHz transmit(radio setup)
139.950 MHz	carrier squelch
155.340 MHz	carrier squelch

FEMA operates an extensive high frequency network, called the **FOXTROT channels**. The list is too extensive to be printed here, but the main frequency to monitor in an emergency is 10.493 MHz. This is their day emergency channel. It is known as FOXTROT 28. ***Other channels in use are:***

Channel	Frequency	Use
FOXTROT 15	5.2120	NIGHT EMERGENCY
FOXTROT 25	7.3490	FIXED STATIONS
FOXTROT 35	14.4510	FIXED STATIONS
FOXTROT 37	14.8370	FIXED STATIONS
FOXTROT 44	17.6500	EMERGENCY

During any emergency when the National Guard has been mobilized, check out the high frequency range between 4 and 7 MHz for military operations. As an example, after Hurricane Andrew devastated South Florida, FEMA and the Florida National Guard conducted their primary operations on 5205 kHz.



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HIGH SEAS

EMBARKING ON MARITIME LISTENING

James R. Hay

Comings and Goings...

Over the years, the nature of maritime communications has changed greatly. Back in the days of Nelson and the great naval heroes of history, ships left port and were not heard from again until their return. Today, ships enjoy all the conveniences of home, including telephone, data, and fax communications.

The development of semaphore signaling meant that ships could communicate with whomever was within sight. However, it was not until the advent of radio that ships could remain in touch with the rest of the world. For ships, radio meant improved safety. Not only could ships communicate, but their ability to fix position and navigate was vastly improved.

On the night of April 14-15, 1912, the SS *Titanic* was lost after she struck an iceberg at sea. This great shipping disaster would have been worse, had it not been for wireless. It was through wireless that news of the disaster reached the world and ships in the area were alerted to the plight of the great liner.

Radio proved its value for maritime communications in the fall of 1913 when a severe storm swept across the upper Great Lakes. At that time ships relied on the abilities of their captains to judge weather conditions and forecast the weather. If they were in sight of shore, lightstations and other maritime installations displayed warning flags when severe weather was forecast.

The 1913 storm took a heavy toll, with over 200 lives and at least five ships lost. This statistic may not seem significant until one considers that *none* of the ships equipped with radio were lost, nor did they suffer any casualties. It was that storm which proved the value of radio in preventing casualties at sea.

As radio continued to develop, voice communications became possible using amplitude modulation. It wasn't long before suitable equipment was developed and the telephone network expanded sufficiently to pass telephone calls to ships at sea. Single sideband came into use in the 1940's and 1950's. By 1972 single sideband had become mandatory and AM was phased out except for 2182 kHz, where reduced carrier SSB is still used to make it easier for AM receivers to receive calls on that frequency.

HIGH SEAS RADIO
by James R. Hay

MT says good-buy to one of its oldest columns.

Frequency modulation came into use in the 1960's, originally using 15 kHz deviation, changing in 1971 to 5 kHz deviation. By 1977 all VHF-FM marine radios used 5 kHz deviation.

The original 28 VHF channels proved sufficiently popular that the International Telecommunications Union (ITU) added another 29 channels, by using some ingenuity. The original 28 channels were spaced 50 kHz apart. With the change in deviation it was possible to use 25 kHz channel spacing. The new channels were thus added in between the old. To distinguish the fact that these were the new, "in-between" frequencies, the channel numbers used were 60 to 88.

The improved technology meant greater efficiency. When the change was made from AM to SSB, the number of channels was doubled with the spacing between channels changed from 6 kHz to 3 kHz. Efficiency was also improved by virtue of the fact that one quarter of the power was now required to accomplish the same job on SSB versus the older AM.

Technology never stands still, however. MARISAT was the next to come on the scene offering maritime communications by satellite. That organization was later succeeded by INMARSAT, the INternational MARitime SATellite organization. INMARSAT now offers voice and data services on its Standard-A systems and data services via Standard-C. For $10 per minute it is now possible to direct dial a telephone call to or from a ship.

■ Radio Improves Navigation

As radio technology improved, the ability to use radio in direction-finding was developed and refined. Many stations were established for the purpose of providing bearings to ships at sea. These stations, manned by skilled operators, were able to provide a bearing within two to five degrees, depending on the skill of the operator and the facilities at the station. This represented a great improvement to position-finding in the days before GPS and RADAR.

The need for improved position-finding ability led to the development of several radio-based navigation systems. The LOng RANge navigation system was originally developed by the military and was based on the time taken by radio signals to reach the vessel's receiver from known locations. The system used the signals from two stations, compared their arrival times, and developed a line of position based on the difference in arrival times of the two signals. Another pair of signals would be used to provide a second line of position, and thus a fix could be determined.

The original Loran-A system used an oscilloscope display to provide its information, and the two sets of timing information had to be manipulated on the display by the operator before arriving at the required information to plot the vessel's position. Further development led to Loran-B (which was never publicly released) and the currently-used Loran-C.

While Loran-A required large receivers, skilled operators, and several frequencies between 1800 and 2000 kHz, Loran-C uses small receivers, requires little operator skill, and operates on the single frequency of 100 kHz. Loran-C is still popular and should continue in operation for at least the next ten years.

The Decca Navigator was developed by the Decca company and operated similarly to Loran. Since it remained a proprietary system and license fees of up to $3000 had to be paid to the company, this system fell from favor as Loran coverage spread. While still in use in Europe, Decca Navigator is no longer used in North America.

Using frequencies in the 10 to 15 kHz range is the Omega navigation system. Due to its very low frequency OMEGA provides worldwide coverage where Loran-C does not. It operates similarly to Loran-C and should continue in use for a few more years. Operated by the US military, Omega is due to be phased out as satellite-based navigation is more reliable, especially for military purposes.

As with communications, satellites have come into the picture for navigation. The original SATellite NAVigation system proved to be unreliable, as the time between fixes could be up to several hours when satellites moved out of their predicted orbits—or failed altogether. The Global Positioning System was developed by the United States to provide reliable, worldwide, position information using 24 satellites in circumpolar orbits. Since GPS is fast, convenient, and reliable, it has come into wide use both within and without the maritime community.

Another satellite-based system which has proved invaluable to the maritime community is the Search And Rescue SATellite system originally developed by France, Canada, the United Kingdom, and the former USSR. SARSAT originally was used to rebroadcast signals heard on 121.5 and 243 MHz to ground stations, along with position information calculated by the satellite. Aircraft Emergency Locater Transmitters or ship Emergency Position Indicating Radio Beacons on this frequency offered improved chances of rescue should problems occur aboard their parent ship.

A second type of EPIRB was developed using 405 MHz, which would provide some aditional, basic information about the parent vessel. When a signal is received by a satellite, the information contained in its broadcast are stored, along with time and position information, and then retransmitted when a ground station is known to be within range. This newer type of EPIRB and the service which it renders has considerably improved the chances of rescue over the original VHF system.

In the early 1980's the International Maritime Organization (IMO) began to develop the Future Global Maritime Distress and Safety System (FGMDSS), which became the GMDSS currently being implemented. This new system changes the focus of distress communications and relies heavily on satellite systems.

GMDSS will be fully implemented on January 1st, 1999. Its focus counts on the ship calling a Rescue Coordination Centre (RCC) directly to ask them to dispatch help in case of an emergency. The RCC will then summon the required resources, including ships in the area, to assist the stricken vessel. Currently, distressed ships make a general call to all vessels in the area to assist them.

To provide the needed communications INMARSAT will be relied upon more heavily, as will the navigational information provided by GPS. EPIRPs feeding information to the SARSAT system will take information from the GPS to provide position information to the satellite. Duplication of satellite equipment aboard ship, and regular maintenance in port, will permit shipowners to dispense with their radio officer; CW communications are no longer a requirement. Shipowners, under GMDSS, have the option of using LF, MF, and HF radio, or using satellite communications. The latter is being favored by many shipowners because it does not require trained operators.

Since the turn of the century ship-board communications have changed considerably as radio-based communications systems have evolved from spark-gap transmitters and coherer based receivers to the sophisticated satellite communications equipment used today. Navigation has also changed greatly. No longer need the captain rely on his sextant. A glance at the display of the GPS will tell where the ship is, within a matter of feet. The same GPS can even tell other equipment where the ship is, allowing the vessel to make its own way across the ocean without the intervention of the ship's officers.

Morse code will not die out for some time yet, but the times—they are definitely changing in the maritime communications world.

Change of another sort

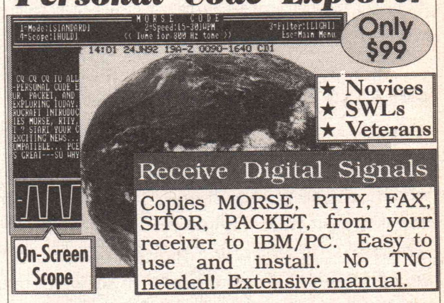
The "High Seas" column first appeared in *Monitoring Times* back in March 1983, and I have enjoyed writing it throughout the years. Some of the most dramatic developments in radio on the high seas have taken place during the twelve years in which I have been writing this column, and I have enjoyed bringing you news of the coming changes.

Other aspects of radio have changed as well, however, and it is now time that this column steps aside to make room for coverage of some of that new and developing radio technology. This will be the last "High Seas" column—though not the last of my presence in the pages of *Monitoring Times*, as I have been asked to continue to provide feature articles on maritime communications. Like the medium on which it reports, *MT*, too, must evolve.

Surfing anyone?

As one who uses the Internet regularly, I am wondering if there is interest in a mailing list (mail reflector) devoted to the discussion of, sharing ideas about, and loggings of maritime radio. If this might be of interest to you, let me know. Send me a message at jrhay@HayA.QC.CA. If there is sufficient interest I will set one up.

During the time that I have written "High Seas," I have enjoyed corresponding with readers. Should you wish to drop me a note I will respond as quickly as I can. I welcome your thoughts and ideas. Suggestions which you might have for future features are also welcome. I can be found at the above e-mail address, or by post at P.O. Box 46003, Pointe Claire, Quebec, Canada, H9R 5R4.



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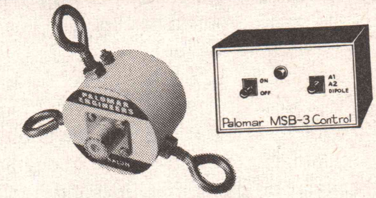

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SATELLITE TV

ADVENTURES IN THE CLARKE BELT

Ken Reitz, KS4ZR

The 1995 World Satellite Almanac

Here's a quiz for you: What weighs 3 pounds, costs $250, and entertains for hours? Is it (a) The newest light-weight IRD, (b) the latest LNBF, (c) a box of Godiva chocolates, (d) the 1995 *World Satellite Almanac*?

The correct answer is, of course, (c) a box of Godiva chocolates, because the *World Satellite Almanac* is not entertainment at all but, in fact, an industry reference book.

A Long Publishing History

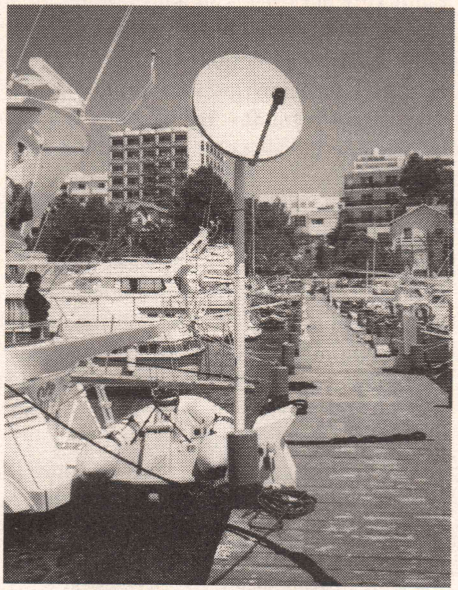
Ten years ago an enterprising author named Mark Long had a great idea which was to publish what he termed "The complete guide to satellite transmission and technology." It was called the *World Satellite Almanac* and it continues today under the publishing banner of Phillips Business Information, where it is edited by Monica Kenny. Phillips publishes *Via Satellite*, an industry trade publication, in addition to numerous trade newsletters dealing with various aspects of the satellite business.

Those early days of the satellite television industry were akin to living in a frontier boomtown. The number of manufacturers and dealers were growing faster than the public debt; professionals and hobbyists worked side by side inventing new products; prices on all products across the board dropped weekly; and encryption was a thing of the future.

At that time books on the subject tended to blend the professional aspects and opportunities with the interests and abilities of the hobbyist. Many manufacturers were bootstrap engineers with backyard production facilities and the home office was literally in the home. There was a thirst for accurate and timely information which was impossible to provide because everything in the industry changed so quickly.

One of the prototypes for this kind of book was *The Home Satellite TV Book* by Anthony Easton, published by Putnam in 1982 (and selling in the bookstores for $10.95). It contained many of the things hobbyists and professionals have always looked for in a good TVRO reference: technical descriptions and explanations; lists of manufacturers and programmers; addresses and phone numbers of satellite related entities; and the all-important footprint maps.

Five years later Mark Long's 1987 *World Satellite Almanac* (then published by Howard W. Sams) sold for $34.95 and had nearly two hundred more pages than the earlier Easton book, reflecting the growth of this vibrant industry. Aside from a nostalgic look back at footprints of satellites which no longer exist, such as Westar II, or services which never made the encryption cut, such as Home Theater Network, these earlier works aren't worth much today.



A dockside satellite installation on the Mediterranean. (Courtesy John Locker)

Changing Times

The advent of DirecTV, USSB, and Primestar has changed considerably the face of the satellite TV industry. Emphasis is less on hardware and more on programming as these services go head-to-head and hand-in-hand with cable interests. Regardless of booming C band sales, publications have focused their interest on the industry and less on the consumer. The result is a change in reference material which is no longer an educational tool so much as a business tool.

The 1995 *World Satellite Almanac* is proof of this change. Gone are the chapters on transmission and reception techniques where the technical difference between Demand Assignment Multiple Access and Spread Spectrum Multiple Access are explained. Gone, too, the lengthy glossary where terms such as "composite baseband" or "dBW" are defined.

Digging Into The Contents

Still, the new *World Satellite Almanac* makes up for the difference with enough details about the satellites ringing the Earth along the Clarke Belt for most industry watchers.

The *World Satellite Almanac* peers into the future with not only a launch schedule for the publication year but an entire section on planned geostationary systems as well as planned non-geostationary systems.

Here we learn about Worldspace, Inc., a Washington, D.C. company with a plan to "...export radio channels to major international, national, and regional broadcasters who then 'spacecast' their programming directly to a new generation of portable digital radio receivers called StaRman™..." The fun starts in 1997 with the launch of one of three satellites carrying 300 watt L and X band circularly polarized transponders.

There's also International Radio Satellite Corporation (Radiosat International) which plans to act as a common carrier for the world's international broadcasters to be able to broadcast directly to small hand-held digital radios with initial service slated for 1997-98. We learn that, if hardware and launch schedules hold, 1997 will be a year of great change for the satellite and broadcasting industries.

Another section entitled "National Data, Regulation and Policy" lists more than 500 countries, territories and islands, their demographics, telecommunications statistics, and (most interestingly) the range of geostationary satellites visible from specific locations in each country. For example: Ghana has 16.2 million people; 42,300 telephones; four AM and one FM radio station; one state-run television network; no private networks; four television stations; 350,000 television sets; 0 cable penetration and 15% VCR penetration. The eastern limit for satellite viewing is 76 degrees East and the western limit is 76 degrees West.

The Upshot

Aside from a certain amount of confusion generated by having five separate indices in different parts of the book and inexplicably numbering the first thirty-eight pages with Roman numerals, the book would benefit from adding more, thick-stock, tabbed section dividers in place of the thin, grey-colored pages which separate the various sections. Two such tabbed dividers for Contents and General Index show how much others are needed.

That this book is primarily a business reference is made clear in the 10-page section on transponder brokers and resellers. Here, eager entrepreneurs can sign up for services in the sky with companies from all over. If you're in the satellite business or planning to get into the

Kalal 6 from St. Petersburg is found on the inclined Gorizont satellite at 53 degrees E. "...It carries a great deal of NBC programming and is weak...streaking caused by threshold extension...." says photograper John Locker.

satellite business, this book would not be an extravagant expense. You'll want to pay that much just for the transponder brokers listing. However, most hobbyists will be stopped cold by the $247 (+ $8.00 shipping) price tag. Your only hope is to convince a local library to add it to their reference shelf.

Meanwhile, if you want to keep up with the business end of the satellite industry on a monthly basis, Phillips Publishing's *Via Satellite* is a good place to start. At $49/year it represents an excellent buy in timely, in-depth information on an industry with a very bright global future. For more information on either the *World Satellite Almanac* or Via Satellite write: Phillips Business Information, Inc., 1201 Seven Locks Road, Suite 300, Potomac, MD 20854 or call 301-340-1520 FAX 301-340-0542.

The Locker Report

Our man on the Mersey, John Locker, sent along a promotional flyer for the latest DBS service available in his locale, Eutelsat's Hot Bird at 13 degrees East (co-located with Eutelsat II-F1). Launched last spring, Hot Bird (also known as Eutelsat II-F6) delivers a whopping 49 dBW signal evident on the accompanying Eurosport billboard photo.

The service also offers a number of radio services, including RAI, France Culture Europe, France Info, France International, and Swiss Radio International. Audio channels Americans will be familiar with are BBC World Service, Deutsche Welle, World Radio Network, and VOA—all available on American C band subcarriers. John says he is up and running with S band video and will try to catch some Space Shuttle video if he can.

Transponder Notes

- Chaparral Communications will stop manufacturing its line of satellite IRDs. It will continue to support its warranty agreements. This is a trend in the receiver building end of the business as marginally successful manufacturers take advantage of the technology lull between the analog present and the digital future of satellite transmissions.
- Industry reports indicate that the Sega Channel (currently available only on cable) will have a future on C band as efforts are made to design hardware for the C band environment.
- Launch pad watching: Hughes will launch Galaxy 3R next month to replace a wobbly G3. The C/Ku bird will see use primarily to serve the cable industry. It's reported that the Ku side will be used for a new Hughes DBS scheme called Galaxy Latin America. It is hoped that by the time you read this Telstar 402R will be up and running. T402 will take its position at 89 degrees West.
- A report from the National Research Council is said to have warned of the dangers space debris at low altitudes could have on the many proposed Low Earth Orbit (LEO) constellation satellite systems. Encounters with even the smallest pieces could result in the destruction of such satellites. Most of the debris is said to be located in a band between 400 and 900 miles up.
- On the DBS front: Following the huge success of the first year RCA will now face some real competition as Sony enters the market with its DSS hardware. USSB is said to have over 400,000 subscribers to its line-up with DirecTV having 600,000. Meanwhile, Primestar is said to have half a million subscribers. This would indicate a total of 1.5 million subscribers for the DSS universe following the first full year of sales and ballyhoo.

Poised to join the fray, following the launch of T402R, will be a Canadian-based company called AlphaStar. Also waiting in the wings is EchoStar, an American company, which hopes to join the DSS fray with the future launch of its own satellites EchoStar I and II co-located at 119 degrees West.

Mailbag

Jose Fernandez of Bayamon, P.R. is using an IC-R7000 with a satellite antenna to receive broadcast transmissions. He would like to receive these signals in stereo. Jose laments the lack of published information regarding transponder frequencies and technical information about feedhorns, LNBs, and other components.

I would like to think that those of us at *MT* hear your requests and will work to focus on matters of interest to our readers. As to your stereo question, I assume that you are talking about SCPC reception. To receive stereo you will need to have two separate receivers. This would require an additional splitter in order to feed two SCPC receivers. Each would be tuned to separate frequencies (i.e. left and right channels). I realize that this is an exorbitant expense but it's how it's done in the broadcast world.

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The L-400B Active Antenna

Contrary to what you might expect, bigger antennas are not always better—especially when it concerns longwave reception. In fact some of the best working antennas are rather small—take loops, ferrite rods and active antennas, for instance.

Many LF newcomers are reluctant to believe this. They start out using the longest wire antenna they can manage, and then wonder why the band is filled with constant buzzing and brutal static levels. At best they'll log a few local beacons and then conclude that the band is not worth further exploration.

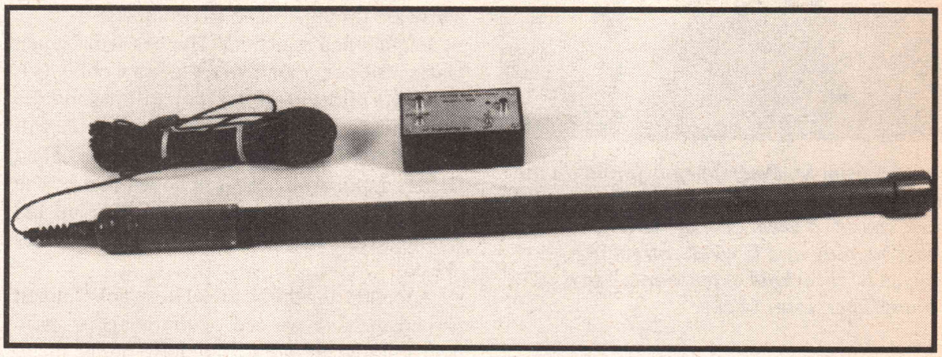
Active antennas are an excellent low noise alternative—especially ones that have been designed specifically for the frequencies below 500 kHz. While the usefulness of *shortwave* active antennas is still being debated within the hobby, active antennas have already proven themselves for LF work. I know several serious listeners who use *only* active antennas for their low band monitoring.

This month, we'll explore one currently popular active antenna—the L-400B offered by LF Engineering Company. I recently purchased one of these units because I needed something to cover the frequencies from 3 kHz to 100 kHz. I also wanted something that could be taken along for portable DXpeditions. What follows are my own experiences while installing and using the L-400B antenna.

Photo 1 shows the antenna system as received from the factory. It comes in two main sections—a waterproof 26" antenna probe (with coax cable permanently attached), and an indoor coupler box. The antenna probe contains the antenna element and amplifying circuitry, while the coupler box comprises the indoor portion of the system.

The coupler contains an on/off switch, power indicator light, and two RCA-style connectors for attaching the antenna and receiver cables. There is also a connector for external DC power which can be used in place of internal batteries, if desired.

Installation of the antenna was mostly a plug 'n play operation. The only hitch I had was getting the two 9-volt batteries into the coupler case. The instructions show a drawing with the batteries nestled side-by-side in the box, but when I tried to do this, I found that it was a *very* tight fit. It took a bit of effort to get them in correctly.



LF-400B Active Antenna (courtesy of LF Engineering Co.)

Mounting the Antenna

It's been said many times before—Location is *everything* with an active antenna. This was definitely true with the L-400B. When I got the probe near the rain gutters or other antennas on my roof, LF signals became much weaker.

TABLE 1

Signal Strength Comparison

Station	Freq. (kHz)	150' Wire Antenna	L-400B Active Antenna
NAA	24	S9	10 dB over S9
WWVB	60	S5	S8
CF	74	S6	S9
NSS	135	S8	10 DB OVER S9
TUK	194	S4	S7
SSN	208	S6	S9
R	317	S8	5 dB over S9
K	336	S6	S9
AVN	344	5 dB over S9	20 dB over S9
RO	400	S9	10 dB over S9

Because of the antenna's portability, finding the right spot was not a big problem. I simply plugged the antenna into a portable receiver and scouted the roof until I found a suitable location which was 8 to 20 feet high as the instructions recommended.

Physical mounting of the antenna was also a simple process. The probe can be clamped directly to any vertical support, such as a metal pipe or wooden pole. Conveniently, the manufacturer includes a suitable clamp for mounting.

The L-400B comes with 50 feet of small diameter coaxial cable—more than enough for most installations. In my case, I only needed about 25 feet, so I coiled up the extra cable inside the radio room and secured it with a tie wrap. Coaxial loss is negligible at these low frequencies, so there was no point in trimming the cable to a shorter length. Besides, by keeping it long, I'm free to reroute the cable in the future, if necessary.

On the Air Performance

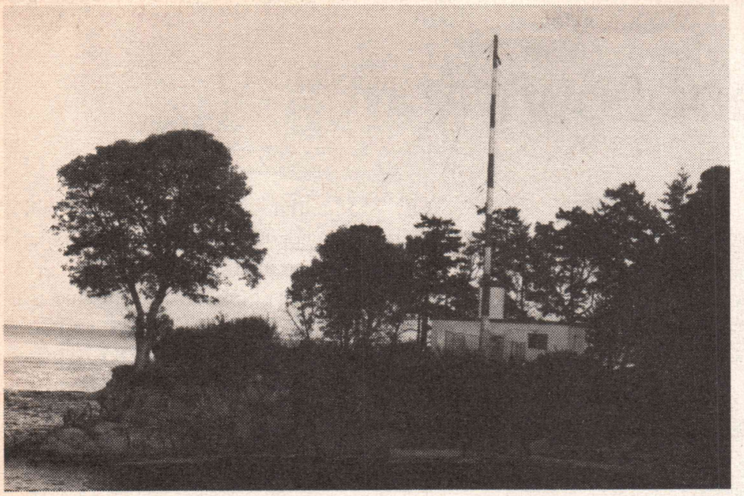
I tested the L-400B with a Drake R8 receiver, which has a provision for switching between two different antennas. I connected my 150 foot wire antenna to one port and the L-400B to the other. This made for an easy "A/B" comparison between the two.

I ran the test during daylight hours with 10 signals on the longwave band. The test frequencies ranged from 24 kHz to 400 kHz. (For frequencies below 100 kHz, I used an LF Engineering L-101 converter ahead of the Drake R8.)

TABLE 2

Specifications for the L-400B Active Antenna

Operating Frequency Range	3 kHz to 530 kHz
DC Power Requirement	two 9 volt batteries
Antenna Probe Size	26 inches long, 1 inch dia.
Antenna Coupler Size	4" x 2-1/8" x 1-5/8"
Filter Rejection	-52 dB at 680 kHz
Lowpass Filter Response	10 kHz–500 kHz +/- 7 dB
Output Impedance	50–100 Ohms
Internal Amplifier Gain	18 dB
Operating Temperature	-25 to 120 degrees F
Antenna Probe Waterproofing	Tested to 2 atmospheres (66 ft.)
Price Class:	$98.00 Postpaid N. America



A view of "AP" (378 kHz) at the Active Pass Light Station, British Columbia, Canada. (Photo by B. Cooley, Victoria, BC)

In all cases, the L-400B delivered higher signal levels and exhibited lower noise than the wire antenna. Table 1 shows how the signal strengths compared between the two antennas.

I experienced no broadcast band interference while using the active antenna despite living within 7 miles of a broadcast transmitter site. That is because the L-400B incorporates a lowpass filter that sharply attenuates all signals above 530 kHz. This is a feature you won't find in general coverage active antennas, such as those designed to work from 100 kHz to 30 MHz.

I have the misfortune of living less than 40 miles from a powerful LORAN site operating on 100 kHz, so signals from it are very strong. I did notice a few spots on the dial, particularly at 200 kHz (Loran's second harmonic) where LORAN signals came sneaking through when using the active antenna. I don't fault the antenna for this, however. It is simply too much signal to expect an amplified system to handle without some overloading.

Fine Points

There was just one disappointing thing I noticed with the L-400B and it didn't have anything to do with performance of the unit. On previous LFE products, I have been impressed with the quality of the front panel labeling. For example, on my L-101 converter the front panel is made of polished metal and the labeling is engraved into its surface, making for a very durable and professional appearance.

On the L-400B however, the coupler panel appears to have been spray painted gray with the lettering simply printed on top of that. The lettering is not nearly as clear as with the engraved process. A minor point, perhaps, but something that was immediately noticeable to me.

The Bottom Line

If you're looking for a no-fuss, reliable antenna with *full* longwave coverage, the L-400B is a solid choice. Mine has been in service for several months now and I'm still adding new signals to my logbook. I have been very pleased with the simplicity of operation and the fact that no tuning is required as you move across the band.

LF Engineering Co. offers a 90 day warranty on the materials and workmanship of each of its products. To get more information on the L-400B or other LFE products, you can write them for a free catalog at: 17 Jeffry Road, Dept. MT, East Haven, CT 06512.

Longwave in the Pacific

Brock Whaley, WH6SZ, checked in via America Online with some loggings from his home in Hawaii. Brock reports that he is hearing ZBB (396 kHz) in Bimini, Bahamas, several Far East longwave broadcasters, numerous GWEN data bursts, and a few West Coast AM broadcast stations including KFAX (1100 kHz) and KTNQ (1020 kHz). He says the AMers start coming through about three hours before local sunset.

The next goal on Brock's list is to pull in TUK (194 kHz), the 4 kW powerhouse based in Nantucket, MA. He's had no luck so far but continues to wait for that magic moment to appear. His equipment line-up includes a Palomar loop, homebrew preamp, Sony 2010, and a classic Hammarlund HQ-140X.

As you explore the band this winter, be sure to share your loggings, photos and letters with *Below 500 kHz.* If you have Internet capability you can always reach me at my e-mail address: koc@mdsroc.com.

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ON THE HAM BANDS

THE FUNDAMENTALS OF AMATEUR RADIO

Ike Kerschner, N3IK

Sunspot Low?

Many of you are wondering when we will be getting back to a more normal set of conditions on the ham bands with lots of DX on 15, 12 and 10 meters. Recent reports indicate that we may have reached the low point of the cycle and will begin the upswing in another two years or so.

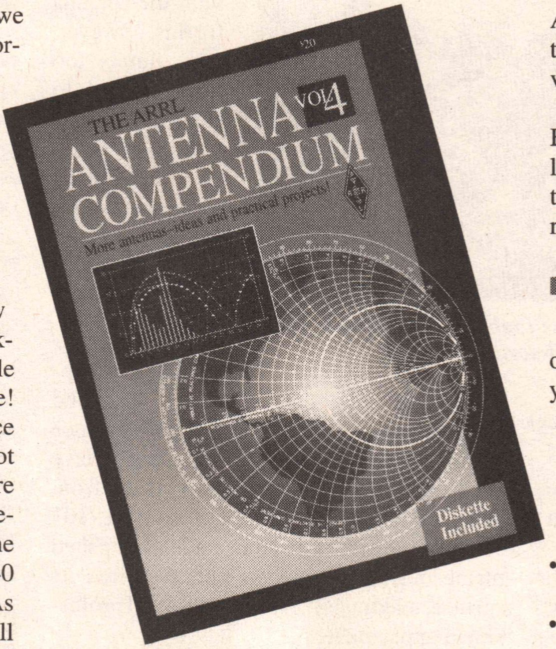
Generally what this means is that we won't see much in the way of hot DX openings on the higher bands for a few years yet. However, DX will still be workable on 160 thru 20 meters on a more reliable basis. In other words, it won't get any worse!

40 meters should be your band of choice if you enjoy working DX on CW. While a lot of DX is workable on SSB it is a bit more difficult due to the need to work split frequencies and search different portions of the band. DX from the east is workable on 40 from just before sunset till well after dark. As night progresses, stations to the west will begin to appear with excellent signal strength. As dawn approaches long haul DX from the other side of the Earth will be easy to work.

One of the major problems with DXing on 40 is the fact that due to frequency restrictions in other parts of the world most stations will be found below 7,025; there are still enough stations that can operate up to 7,050 to provide a lot of fun, but many of the rare stations do not operate in this area at all. (That is a good reason to work on your Extra class ticket).

80 meters, our lowest HF band, is pretty similar in nature to 40 as far as propagation goes. This band, too, has frequency restrictions that make working some of the more rare stations difficult above 3,525. SSB also requires split operation to work many of the countries on 75 meters. By convention, 80 meters is actually split into two bands: from 3.5 to 3.7 is called the 80 meter or CW portion, while 3.7 to 4 is called 75 or the phone portion.

160 meters is the only MF ham band, (it is just above the AM broadcast band). The nature of 160 is quite unique, as most of the time you will be able to hear every station on the band even when DX is pouring in (unlike the HF bands where propagation makes it impossible to hear close-in stations most of the time). Propagation for DX on this band also follows the Sun, with stations to the east being readable after sunset and westerly stations becoming audible as dawn approaches.



160 has for many years been cut up into small portions in many countries, so if you plan on looking for a particular DX country on this band, check the band plans to see where that country is allowed to operate.

Antennas

There is no question that decent antennas for these three bands require more real estate than the other bands, but remember it is possible to work a lot with a simple dipole or short, loaded antennas. A good compromise antenna for low band operation is a 30 foot vertical with as good a ground system as you can possibly obtain.

On 40 meters, 30 feet equals a quarter wave; on 80 and 160 it will be necessary to load the antenna with an inductor or some other means. On 80, loading wires and in many cases a good transmatch will do an excellent job with a 30 foot vertical. 160 is a different proposition, though, and loading of some kind will be required in most cases.

A 40 meter loop is a super DX antenna and does not require that much real estate, plus a loop works very well at low heights. Any good antenna manual will give you all the info you need to construct either a loaded vertical or loop antenna.

One excellent commercial antenna is the Butternut HF-2V with optional 160 meter loading coil (mine works great on 20 meters, too). Almost any amateur supply house carries the HF-2V. Call for latest prices.

ARRL Antenna Compendium, Vol 4

This excellent how-to book contains a lot of information that will allow you to design your own antenna and it encourages experimentation. In addition, this volume contains software that will give the tools to do it. The diskette is IBM 3.5 inch 720kB and contains the following executable programs:

- Antenna pattern display program and documentation
- 59 PLTfiles for use with PLOT
- Mobile: an antenna analysis and design program for mobile whips
- LNVI: a program for computing maximum and minimum currents and voltages along a transmission line
- Horizon: For VHF/UHF propagation analysis over real terrain
- Four executable programs with BASIC source code for mobile antenna/tuner analysis
- Basic source code for automating antenna pattern plotting measurements
- 27 ANT model data files, to be used in commercial modeling programs
- 11 EN model data files, to be used in commercial modeling programs
- 26 NEC model data files to be used in the NEC2.EXE modeling program

(Please note: ELNEC, NEC and NEC2 are not included with the programs.)

In addition, many construction articles for 160 through UHF antennas are included in this fine book. Of special interest is a section on mobile antennas.

The software alone is worth the $20.00 price of the book. *Antenna Compendium Vol 4* is available from the ARRL, 225 Main st. Newington, CT 06111, or your local ham dealer.

That's all for November, gang; have a good Thanksgiving. 73 de Ike, N3IK.

NET NEWS
A JOURNEY THROUGH CYBERSPACE

Bill Grove
bill@grove.net

This Ain't Yer Pappy's Ham Radio

Times are changing. Not just the times we live in, but the *Times* we read. This article is proof of it. Whether you have prepared yourself over the past few years or are just catching the hind tail of the rush, computers are now a part of life. Here in *Monitoring Times* we are keeping up with the pace of technology by not only offering access to our magazine via the World Wide Web, but also by initiating you into this new world with a column dedicated to giving you what you need to succeed in this vast new realm.

What's out there? In the past few years, new technology has ripped through the old views that the computer was a dry and boring device to own, too difficult for the average user to control. Since then, computer software designers as well as hardware manufacturers have devoted a majority of their resources to making the computer more "user-friendly" or easy to use. In that respect, they were quite successful. However, with this new ease of use comes a wave of new programs, operating systems and hardware for you to choose from. Which is right for you? We'll be giving you some choices.

My focus here is dedicated to the Internet—that vast world where anything is possible and everything is done. Some fear it, some devour it, and some just wander through getting what they need. No matter what your perception, the 'Net is the newest world to roam, and here are some of the things you'll find.

The basic part of the Internet that we'll use here is the World Wide Web. The World Wide Web, or WWW, is the graphical interface to the Internet. Instead of using ancient UNIX and DOS commands to maneuver through cyberspace, you use your mouse to simply point and click on what you want to see. This is the idea and technology that has revolutionized the world of computers. If you have a computer with Windows, Win95, or a Macintosh, all you need is a modem and a few basic programs (most of which are free), plus an Internet account, and you're ready to go!

Basic hardware requirments to access Internet are: an IBM-compatible 386 computer, 4mb of RAM, VGA graphics and monitor, 14,400bps modem, and about 20mb of free hard disk space; or, a MacIntosh Plus (or 68030 processor), about 20mb of free hard disk space, and 4mb of RAM. The Internet account is a dial-up access, much like CompuServe or America OnLine, but it is direct access to the Internet. In most cases, instead of paying many dollars an hour access through the other services, you pay one rate and are on as long as you like.

Once you have the basic programs up and running (i.e., Trumpet Winsock or MacTCP, plus Netscape) then point your browser (Netscape) at **www.grove.net**. We think you'll be pleasantly surprised. Grove Enterprises has put home pages for *MT, ST*, our Grove catalog, and many other goodies online for your benefit. We don't expect you to live on that page, but it's a good starting point and a nice reference for the future. Check in from time to time to see what late-breaking news, frequency lists, or hobby surveys we may have added, or leave us E-Mail at **mt@grove.net**.

Audio on the Web

Since *Monitoring Times* readers are devoted audio people, we'll start with some fantastic new programs devoted to bringing you live audio accross the Net. The first of these is called Real Audio (**www.realaudio.com**). Real Audio brings live audio from many places around the world, right to your computer. For many of you, this is nothing new, since you've been DXing the world for years. But to computer users, this is a wild new technology—to grasp those voices calling out from some distant country.

A new program from Xing Technology (**www.xingtech.com**), dubbed StreamWorks, allows even higher quality audio. CD quality, 44 kHz, sampled audio in full stereo runs right into your computer. Unfortunately, you need a much faster phone line than most consumers have to gain full benefit from the program.

For those hams who are looking for a new frontier, the Internet Phone from Vocaltec (**www.vocaltec.com**) has what you need. Live simplex communication across the Internet is possible for a cost of around $60 (one-time fee). And, if you have a sound card capable of playing and recording at the same time (duplex), then you can have a conversation just like you have over a standard telephone line, except there are never any long-distance charges! Imagine: unlimited, full-duplex, digital quality communications anywhere in the world, for only $60! Quite a deal.

There are many avenues to take in the wonderous new land of Internet. In the following months we will help introduce this new technology and its basic uses into your home and will try to make your journey as easy and painless as possible. If you have questions you would like answered or ideas for future articles, please direct them to me via E-mail or to the *MT* address. Have fun in the ethernet!

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OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller

Israel Busts Pirates

Israeli police raided a right wing shipboard pirate, Channel 7, on August 7 in Ashdod, Israel. The ship housing this station's transmitters was in port for repairs. Authorities charged that the station had neither authorization nor license that would permit broadcasting. Station personnel were held for questioning, and equipment was seized.

Politicians quickly criticized the move. Eliezer Sandberg, a member of the rightist Tsomet Party, charged that the government was trying to silence its opposition. Shaul Yahalom of the National Religious Party and Yeboshua Matza of Likud were ejected from the Knesset for causing disturbances during a debate on the matter. Thanks go to *MT* reader Steven Thow of Montreal, Quebec, who sent in an account of this bust from *The Canadian Jewish News.* The paper did not mention a frequency of operation.

■ SRS E-mail

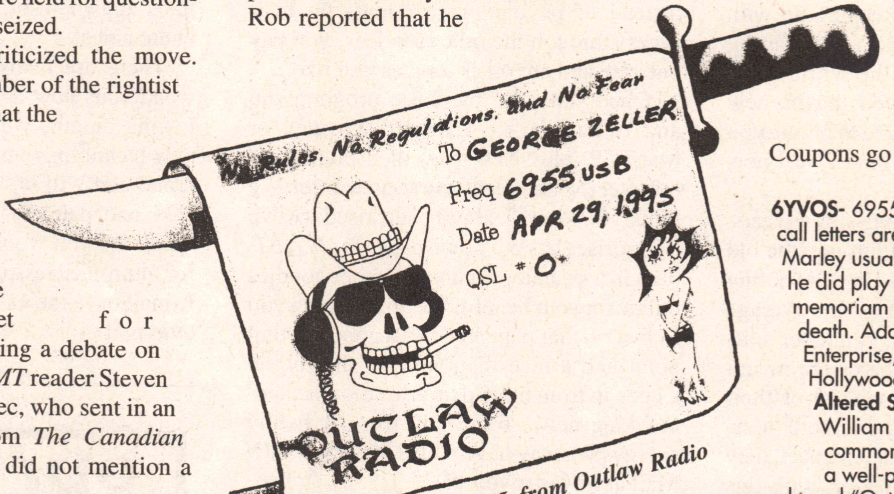
The computerized European *SRS* pirate newsletter has changed its e-mail contact address. Their jonny_augustsson@swedx.ct.se contact point replaces a previous *SRS* direct address. Some pirates, notably the **Voice of the Rock,** can also be reached via this means.

■ Bootleg Signals

J. C. Mello of Scituate, RI, writes in to report that he often hears what appears to be pirate stations in Spanish. For instance, at 0045 UTC on 6957 kHz he monitored bits of Latin American music and short messages in Spanish. He wonders what this might have been.

Actually, reception of two-way Spanish language transmissions is a relatively common event on both the 41 and 43 meter pirate bands. In many Central and South American countries, people frequently use converted amateur radio transmitters as two-way communications devices, particularly in rural areas. These bootleg transmissions propagate to North America on a consistent basis. The radio regulations enforcement process in several Latin American countries is somewhat looser than we are used to in the United States and Canada.

■ QSL Clarification



A knife, a skull, and a QSL from Outlaw Radio

Both Robert Ross of London, Ontario, and David Miller of **Southern Music Radio** in New Zealand wrote in with a clarification on Rob's QSL from this station that we printed in the July Outer Limits. Rob reported that he was happy to receive this station's verie, but that it took 14 months in the mail. Both Rob and David note that Rob received two QSL's, one of which came in only two months. For what it's worth, my own QSL arrived in only 31 days from New Zealand. We all have stories to tell about very fast and very slow mail service; this is just one of the things that DXers have to get used to.

■ What We Are Hearing

A massive volume of pirate activity has been taking place lately, and our readers sent in loggings of nearly three dozen stations this month. With both Veterans Day and Thanksgiving coming up in November, this could be a good time to check out the North American shortwave pirate bands. Your own intercepts are always very welcome for this column c/o PO Box 98, Brasstown, NC 28902. Times are in UTC, with frequencies in kHz.

Maildrop addresses used by pirate stations reported this month include PO Box 452, Wellsville, NY 14895; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; PO Box 17534, Atlanta, GA 30316; PO Box 605, Huntsville, AL 35804; PO Box 293, Merlin, Ontario N0P 1W0; Ostra Porten 29, S-44254 Ytterby, Sweden; PO Box 3103, Onekawa, Napier, New Zealand; and Postfach 220342, D-42373 Wuppertal, Germany.

Three 29¢ stamps should go in the envelope to USA addresses; $1 or $2 US or two International Reply Coupons go to foreign drops.

6YVOS- 6955 at 0245. Their Jamaican call letters are no accident, since Pigpen Marley usually sticks to reggae music. But, he did play some Grateful Dead songs in memoriam following Jerry Garcia's death. Addr: Wellsville. (Barry Williams, Enterprise, AL; Randy Ruger, North Hollywood, CA)

Altered States Radio- 6955 at 0400. William Hurt's version of the most commonly used pirate radio format is a well-produced blend of rock music, comedy and "Outer Limits" TV show audio. This one has been around since 1993; it offers "Dead Rock Stars" QSL's. Addr: Merlin. (William Hassig, Mt. Prospect, IL; Williams)

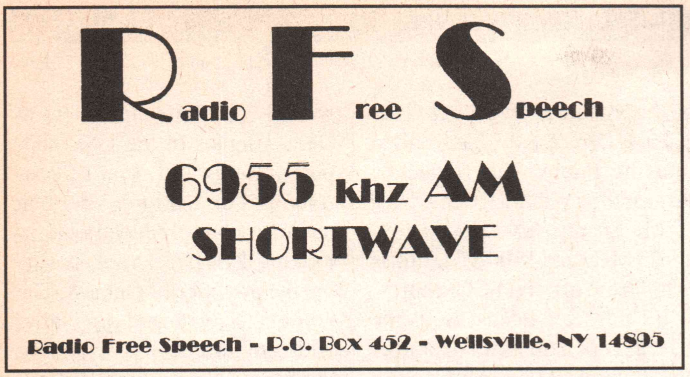
Atomic Frog Radio- 6969 at 0015. This new one programmed rock music and comedy sketches, but they unfortunately announced that their effort was a one-time broadcast. Addr: Wellsville. (Dick Pearce, Brattleboro, VT)

Caribbean Sound System- 6955 at 0230. It had been a while since this one was active, but their good late summer signal featured music from a cruise ship with host Count Whip. Addr: Stoneham. (Chris Lobdell, Tewksbury, MA; Dennis Myhand, Mercedes, TX; Basil Shelley, Blythe, CA; Jesse Rose, Hampton, VA; Pearce; Ruger; Williams; Hassig)

CSIC- 6955 at 0100. Pirate Rambo's Canadian rock and comedy station is best noted for its "Psycho Chicken" interval signal that is played at the beginning and end of all broadcasts. Addr: Blue Ridge Summit or Merlin. (Rob Keeney, Overland Park, KS; Rose; Williams)

East Coast Music Radio- 6958 at 0100. Pirate Pete has been around since 1992 with his rock music and audio from cartoons. Look for his interval signal played on a xylophone. Addr: Wellsville. (Michael Prindle, New Suffolk, NY; Hassig)

Free Hope Experience- 6955 at 0515. Major Spook sometimes transmits his rock music and drama sketches at late evening hours, so Basil found that the signal made it to the West Coast. We welcome Gigi back from her recent visit to **Radio Portugal.** Addr: None, but said would verify logs in *The ACE* and *Pirate Pages.* (Gigi Lytle, Lubbock, TX; Glen Hunkler, Fremont, CA; Ross; Shelley; Hassig)



Radio Free Speech

6955 khz AM

SHORTWAVE

Radio Free Speech - P.O. Box 452 - Wellsville, NY 14895

The new Radio Free Speech QSL design

JAZZ- 6955 at 0000. The music on this station is consistent with its call letters. Although they have announced a maildrop, the 'droperator is still trying to find them. Addr: Wellsville. (Rose)

KAT- 6956 at 2230. Their first broadcast in September said that the station is in the Kappa Alpha Tau fraternity house at the University of Wisconsin at Madison. The format, advertised as a combination of college radio and pirate radio, includes many different musical styles and parody ads. Addr: None, but said would verify loggings in *The ACE* and *Pirate Pages*. (Ross; Williams)

KDED- 6955 at 0045. The Voice of the Grateful Dead of course produced a memorial program following the untimely death of famous guitarist Jerry Garcia. The station is discouraged, and is considering a halt to its broadcasting activity. Addr: Wellsville. (Shelley; Hassig)

Key West Radio- 6955 at 0345. Their first test transmission, featuring extensive Firesign Theater comedy selections, was widely heard. Ken McHarg of **HCJB** even had a log from Quito in *Fine Tuning* #792! It remains to be seen if their format will change during regular broadcasts. Addr: None, but said would verify loggings in *The ACE.* (Ruger; Shelley)

KGDR- 6955 at 0045. Not to be confused with **KDED,** this one memorialized Jerry Garcia with several of his songs and a "Grateful Dead Radio" slogan. Addr: Providence. (David Chapchuk, Scranton, PA; Williams; Rose; Lobdell)

KICK- 6955 at 0200. Chief Engineer Pete Moss sent Rob QSL #37 in 7 months, including a copy of the station's playlist. Addr: Huntsville. (Ross)

KIWI- 7445 at 0600. Graham Barclay's New Zealand pirate is an extremely difficult DX catch, but Jesse proved that it can be heard. Congrats! Now that winter DX conditions are approaching, this frequency is worth checking around this time on local Saturday nights. Addr: Napier. (Rose)

North American Pirate Relay Service (NAPRS)- 6955 at 0000. Richard T. Pistek is once again regularly heard on the pirate bands, usually with relays of other pirates. He specializes in European stations that are otherwise extremely difficult to hear on this side of the Atlantic. Addr: Wellsville. (Williams)

Outlaw Radio- 6955 at 0300. Normally they play rock music mixed with sound effects, including their trademark air raid siren. During one broadcast they said that our own Gayle Van Horn had received their QSL (see illustration), and they played a music request for her. The station notes that they have no affiliation with **Outlaw X.** Addr: Providence. (Rob Keeney, Overland Park, KS; Williams; Lytle; Ross; direct from the station)

Primitive Radio- 6955 at 0130. Holden Caulfield's pirate operation mixes progressive rock music with poetry readings. Addr: Wellsville. (Ross)

POLKA- 13900 at 1715. The call letters of this new station say it all. Instead of rock music and comedy, this one plays polkas and comedy bits. Their frequency proves that not all pirate broadcasts are found on 43 meters near 6955 kHz. Addr: Stoneham. (George Zeller, Cleveland, OH)

Radio Amazonia- 6955 at 0300. This Europirate was an extremely rare catch on this side of the Atlantic until it established a North American relay. It's now been widely heard with rock and comedy. The operator cautions that "SRS" should be substituted for the station name on envelopes containing reception reports, which should include International Reply Cupons instead of cash for return postage. Addr: Ytterby. (Hassig; Williams; Ross)

Radio Dr. Tim- 6955 at 0000. This Europirate's rock music shows are produced in Germany, but when we hear them it is generally via a **NAPRS** relay. Addr: Wuppertal. (Pearce)

Radio Free Euphoria- 6955 at 0000. The friendly Maharishi Ali Ganja produces a blend of rock music, comedy, and drug advocacy. Addr: Wellsville. (Williams)

Radio Free Speech- 6955 at 0400. Bill O. Rights says that he has an improved version of Radio Free America, dedicated to the principle of free speech. He mixes in rock music and comedy, but political commentary is a staple. We picture their new QSL. Addr: Wellsville. (Williams; Ross; direct from the station)

Radio Perfekt- 6955 at 0000. Their unusual format of country music with a Europirate slant is heard from time to time in North America via a **NAPRS** relay. Addr: Wuppertal. (Roger Hehemann, Jeffersonville, PA; Ross; Hassig; Lobdell; Williams; Pearce)

Radio Titanic International- 6955 at 2130. They say that their European broadcasting activity has been on for two decades. Their North American relays now make this one a relatively common catch. Sometimes they mix in a mailbag segment with their slick productions of rock music. Addr: Wuppertal. (Ross; Hassig; Williams)

Radio USA- 6957 at 2130. Mr. Blue Sky and Joe King have been programming punk rock music, comedy sketches, and pirate radio commentary for a decade and a half. Addr: Wellsville. (Chapchuk; Williams)

Radio X- 6955 at 0030. They claim to be the Voice of De-evolution, emphasizing Devo music. Addr: None, but said would verify *Pirate Pages* loggings. (Pearce)

RBCN- 6955 at 0200. Radio Bob's recent humor was a parody of the O. J. Simpson trial, but his originally produced comedy is always funny. In the past, this one often has aired broadcasts while the Grove Communications Expo is in progress. Addr: Atlanta. (Hassig; Ross)

RFM- 6955 at 2345. H. V. (as in Victor) Short's mellow tunes straddle the border between rock, jazz, and new age music. He always inserts originally produced gag ads. Addr: Wellsville. (Hassig; Ross)

Starshine Radio- 6955 at 0200. This oldies rock station has some similarities to **WPIG,** since the announcer sings along with the tunes during the shows. The judges have differing opinions on the quality of this guy's "singing." Addr: Wuppertal. (Mello; Williams)

The Fox- 6955 at 1715. This veteran station has returned with a blend of rock music, commentary about radio, and criticisms of the FCC. Addr: Blue Ridge Summit. (Ross)

Voice of Helium- 6955 at 2230. The theme on this clever new station is helium, with an interval signal of "Classical Gas." Oldies rock and endless parodies about gases make up the programming. And yes, the announcer sometimes sounds like he's been inhaling a tank of something. Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH)

WLAR- 6955 at 0100. Although this rocker was busted by the FCC in 1991, somebody has been playing old tapes of its programming lately. It's hard to say if it would respond to correspondence through its old address. Addr: Wellsville. (Ross)

WPIG- 6955 at 2315. Ira's pig songs, oinking noises, and general pig advocacy from New Jersey were so crudely produced that the station has become a legend in pirate radio. Somebody has been relaying these classic "programs," but Ira is apparently not associated with the relays. Addr: Wellsville. (Neil Wolfish, Toronto, Ontario; Hassig)

WREC- 6955 at 0300. P. J. Sparx often transmits his own rock music programs, but he has been known to regularly relay other pirates, both from Europe and North America. Mike snagged their 2nd Anniversary QSL. Addr: Wellsville. (Mike Grobstein, Skokie, IL; Ross; Hassig)

WRV- 6955 at 0215. Pete the Pirate plays rock music at The Radio Virus, "The Station Nobody Wants to Catch." Addr: Wellsville. (Hassig)

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WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewers: Rachel Baughn, Bob Grove, Haskell Moore

Radio's "Berlin Wall" Crumbles

Listen to this. According to Tom Bernie of Cellular Security Group, *all* 800 MHz scanners are now cellular restorable. That's right. No matter what model you have or when you bought it, no matter if it's been factory "cellular blocked" and has been labeled "unrestorable," the rules of the ECPA game have just changed. If the radio receives 800 MHz, Bernie says that he can now restore it to full cellular coverage.

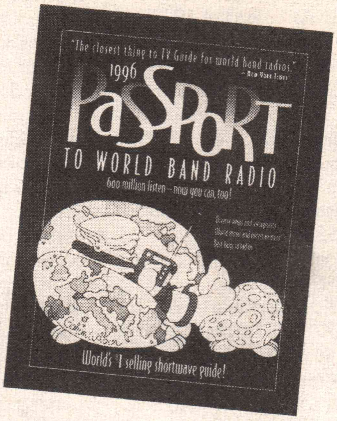
The procedure, developed by Steve Donnell, columnist for *National Scanning* and RCMA's *Scanner Journal*, is pretty incredible. Every 800 MHz scanner actually receives full 800 MHz coverage. The CPU, however, is programmed to ignore it. Bernie's procedure uses "existing components of the radio's circuit to create a switchable, internal down-converter."

Right now, Bernie is prepared to begin restoring cellular coverage to the PRO-23, PRO-51, PRO-26, BC-220, BC-860, BC-3000, BC-8500, and BC-9000.

The procedure, called the "Virtual 800 MHz Down Converter," is installed for $99.00 including return shipping. Customers must call for a reservation number at 508-281-8892. For more information write to Cellular Security Group at 4 Gerring Road, Gloucester, MA 01930.

Passport '96

If you're old enough to remember when the world of shortwave revolved around only one annual guide book, you're a real hobby old-timer. The newest—*Passport to World Band Radio*—is now more than a household name: when it comes to shortwave it is arguably the clear-cut leader between the two books.


"The closest thing to TV Guide for world band radios." – New York Times
1996
PASSPORT
TO WORLD BAND RADIO
600 million listen – now you can, too!
World's #1 selling shortwave guide!

This year's *Passport* kicks off the shortwave listening season with a book bulging with information. It'll take a couple of minutes before the newcomer's head stops swimming, but once it does, hobbyists will find virtually everything one could need or want in this book. Sure, you'll stumble across a heading about "disestablishmentarian program[s]," and some footnotes that might make an ancient Egyptian hieroglyphographer smile. Get through the arrows and boxes with letters in them—they're all very helpful—and you'll be OK. But, hey, no one said that shortwave was easy. It's not.

From articles to equipment reviews, station addresses, program listings, and the good old-fashioned by-frequency blue pages, nothing is left out.

This year's book will no doubt go down as one of the best with just over 500 pages crammed full of helpful information. Published by IBS, *Passport* is available from a wide range of sources, including Grove Enterprises, for $19.95 plus $6 UPS shipping. To order, call 1-800-438-8155.

Mr. Scanner Goes CD ROM

Scanner listeners are by no means being left out when it comes to frequency information. Mr. Scanner, known for his work on the popular *Betty Bearcat Frequency Directories*, has vaulted into the future with frequency information on CD ROM.

Mr. Scanner's CD ROM covers 25 MHz and 1300 MHz and is taken from official FCC records. It includes all licensees in the U.S. except ham radio operators and federal government operations.

A basic run-down of features includes three main options: view, print, and export. You can look up information by city and county and service in three seconds or under, view a single frequency, a single service, licensee, or call sign. From here you can print out everything on the database including frequency, call sign, licensee name, city, state, county, service, and geographic coordinates.

The Mr. Scanner CD operates entirely from CD and does not use your hard drive at all. It also contains the *National Police Directory* which also contains Canadian frequencies plus radio codes and signals. For more information or to order, call Mr. Scanner at 1-800-423-1331. The price is $35.00, plus $2.00 shipping and handling.

Haruteq Ontario Edition

HARUTEQ
SCANNER BOOK
ONTARIO

Judging by the newest edition of Haruteq's *Ontario Scanner Directory*, Bart Veerman may well be Canada's equivalent to Gene Hughes in the US. Stepping into his 13th year of continuous publication, Veerman has once again produced a sharp-looking 214-page book covering the province of Ontario. The volume is arranged logically, with an introduction covering the basics of scanning and explaining the layouts of police, fire, ambulance, and transportation services, followed by a frequency bandplan for Ontario.

The book then plunges directly into the good stuff, frequencies arranged in ascending order beginning at 20 MHz. Three columns per page listing Frequency/PL, City/Area, User and Description make for small typeface, but the print is clear and not especially difficult to read.

The second half of the book gives listings arranged by city/area, making the volume a complete and easy reference. Sprinkled in several places are tips on antennas, cellular monitoring, and other tidbits from which both the new or experienced scanner user can benefit.

Haruteq also produces volumes for Quebec, Atlantic Canada, Central Canada, and British Columbia. The Ontario edition is $24.95 (Canadian) from Haruteq, Fennell P.O. Box 61508, Hamilton, Ontario, Canada, L8T 5A1 or you call between 12pm-5pm Monday through Friday, (905) 574-9003. Tell them *MT* sent you!

New Sony Shortwave

Sony has announced a new receiver intended for release this month. The ICF-SW1000T incorporates a stereo cassette player/recorder into the receiver to make it easy to record a favorite program, catch an ID for logging your DX, or recording for later playback using the time record/play feature.

Front and back views of the new Sony SW1000T

The SW1000T includes all bands from long wave to shortwave to FM and Single Side Band, though we have not seen specs on the exact frequency coverage. Other features include synchronous detection, 32 station memory presets, 1 kHz step tuning, FM stereo reception, built-in clock with alarm, and a sleep timer.

The information supplied by Sony lists a stereo microphone, stereo headphones, active antenna, and a carrying case as being included in the suggested retail price of $699.95. Watch for the Sony SW1000T to arrive soon in local radio stores.

— RB

CB with Weather Band

Citizen's Band radio is far from dead, and if you talk to the folks at Cobra Electronics, they'll be sure to tell you so. They've proved their belief in the continued usefulness of CB by releasing the 93LTD WX base station.

The unit can be used at home or in a car, and has a full range of features, including instant access to emergency channel 9 and constant weather channel monitoring. The radio, whether turned off or on, receives National Weather Service tone alerts, warning the user to tune in for severe weather information.

The 93LTD uses an oversized LED channel display for easy readability, as well as an illuminated power output/signal strength meter. An automatic noise limiter/blanker is built-in, and an external speaker and headset jack allow private listening.

The 93LTD WX sells for $179.95. Contact Cobra Electronics, 6500 West Cortland Street, Chicago, Illinois 60635.

Shortwave Station Programs

You can take the man out of his DX show, but you can't take broadcasting out of Ian McFarland. Ever since retirement from Radio Canada International, Ian McFarland continues to pop up here and there. Now he's back with a neat idea for SWLs. Here's the money-saving deal: Instead of writing to each individual station, you write to Ian. Ian assembles a collection of current station schedules and mails them to you.

So far, five stations have joined the project and McFarland hopes to add more in the near future. All you have to do is drop Ian a postcard, including your name and address. It's that simple. Send your request for a schedule packet to: Marbian Productions International, P.O. Box 1051M, Pointe Claire, Quebec, Canada H9S 4H9. Mention *MT*, if you would be so kind.

Suffering from high postage costs?

Don't spend a lot of money on postage to get program schedules from SW stations.

For just the cost of the stamp on your postcard we will send you, FREE, a selection of current SW station program schedules from around the world.

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Canada H9S 4H9
FAX: +1 (514) 697-2615

Low Level Interference

Have you ever gone looking for some of that really wild, low frequency DX you read about in Glenn Hauser's column, only to find your local broadcast band station plastered everywhere below 7 MHz? — Say Mexico's Radio Huatacocotla is back on the air at 2404.5 for a special, once-only broadcast celebrating the opening of a Taco Bell downtown. You have to catch it. But there's no way, unless you can wipe out the interference.

Craig Siegenthaler of Kiwa Electronics has created a really tight BCB filter that's inserted between the antenna and receiver. Any BCB signal below 1.70 MHz is heavily attenuated, but signals above 1.75 MHz pass through with virtually no signal loss. What makes Kiwa's BCB filter impressive is its steep filter slope and flat passband.

The whole filter is housed in a water-tight, heavy-duty, cast aluminum box. Input and output connectors are SO-239.

For more information, contact Craig at 1-800-398-1146 or write Kiwa Electronics, 612 South 14th Ave., Yakima, WA 98902.

World Atlas for Amateurs

A new release from the American Radio Relay League is the *Radio Amateurs World Atlas*, an 8-1/4 x 11-1/2 inch booklet featuring color maps of North America, Central America/West Indies, South America, Asia, Indian Ocean, Japan, Australia/Pacific Ocean, Europe, Africa and Antarctica.

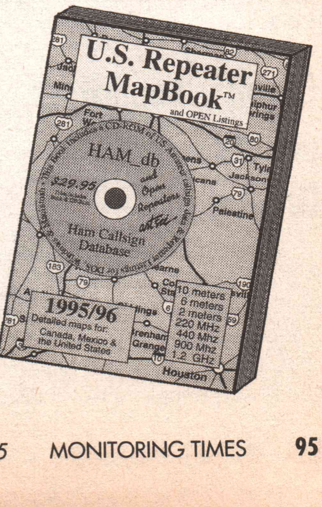
Each plate shows country boundaries with prefixes, CQ zones, states/provinces, major cities, rivers, and mountain ranges. The booklet was originally published by the German Amateur Radio Organization (DARC) and is now being sold in the US by ARRL to complement their ARRL *World Map* and *Map of the US*. The *Radio Amateurs World Atlas* retails for $9.95 from your local dealer or from ARRL (add $3 shipping, $4 UPS): ARRL Publication Sales, 225 Main Street, Newington, Connecticut 06111-1494.

Ham Callsigns Plus!

Hundreds of thousands of U.S. radio amateurs populate the radio frequencies from 1.8 MHz up; their callsigns are registered with the FCC (Federal Communications Commission), but do not appear on the FCC Master File; they are only available from a database subset offered by a limited number of ham publishers.

An additional, and very useful, reference is a state-by-state map and list of ham repeaters for the 29, 50, 144, 222, 440, 902, and 1270 MHz bands. And wouldn't it be nice if the ham—or listener—could have both of these sources at one low price?

Just released is the 1995/96 *U.S. Repeater MapBook* featuring illustrated maps of the U.S. and Canada, along with city-by-



city listings of ham repeater frequencies. And along with the book is a CD-ROM of the entire U.S. amateur callsign database, identifying the names and locations of hams across the nation.

The *Callsign CD-ROM* with *U.S. Repeater MapBook* is only $29.95 plus shipping from ArtSci, PO Box 1428, Burbank, CA 91507; ph. 818-843-4080.

— BG

Repeater Directory Goes Electronic

If you'd like that repeater list on a disk instead of on a map, the American Radio Relay League announces publication of The ARRL *Electronic Repeater Directory* 1995-96 edition. This software was produced by Jerry Redington, KD6PPC, for IBM and compatible computers. It puts complete ARRL repeater information on disk for easy and quick retrieval.

The software contains everything you'll find in the print version of the *Repeater Directory*. More than 20,000 repeaters in the US, Canada, Mexico, Caribbean, South America, and Europe reside on this disk and you can select and print out just what you need. The ARRL *Electronic Repeater Directory* retails for $14.95 and requires MS-DOS, 286 or higher processor, 380 kB of memory, 1.3 MB hard drive space, VGA compatible video graphics adapter, and optional Microsoft mouse.

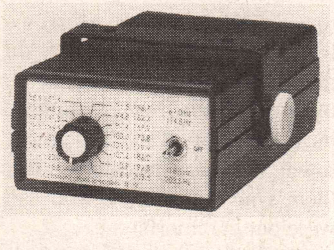
Contact ARRL Publication Sales, 225 Main Street, Newington, Connecticut 06111-1494.

Circuits, Capacitors, and Adapters, Oh My!

The Quest Electronics catalog is a feast for the tinkerer, modifier, or just plain radio hobbyist. Not only are their prices reasonable, but the company has just about everything you'd ever need when it comes to integrated circuits, diodes, transistors, tubes, capacitors, heat sinks, fans, connectors, resistors, and more.

They say if you don't see what you want, ask. Their inventory changes daily. Get your hands on this catalog by writing Quest Electronics, 5715 W. 11th Avenue, Denver, Colorado 80214.

TE-32 Multi-tone Encoder



Communications Specialists, Inc. has announced a new variation of their popular SS-32P CTCSS tone encoder. The model TE-32 now provides direct access from a front dial rotary switch to all EIA CTCSS tones ranging from 67.0 to 203.5 Hz, allowing users to access repeaters that require CTCSS tones.

The unit is housed in a high impact plastic case measuring 5.25" x 3.3" x 1.7" and comes with a mounting bracket, related hardware and a three foot long shielded cable. Use it mobile or on your test bench. The TE-32 is $49.95 and comes with a 1 year warranty. To order call 800-854-0547 or write Communications Specialists, Inc., 426 West Taft Ave., Orange, CA 92665-4296.

Log Keeping for PC's

For hams, keeping a radio log is almost like keeping a checkbook—a slightly compulsive, always accurate necessity. Now, Milestone Technologies has announced the release of M*LOG, a new general purpose radio log-keeping system for DOS-based personal computers.

Based on Milestone's LOGMASTER II, this completely rewritten program uses compiler technology plus many new features like automatic country lookup; virtually unlimited QSO data, including six individual fields which the user can name; unlimited remarks and notes; and access to callbook databases. You can also create templates for QSL data output and log reports, and QSL data can be printed directly on cards or labels or saved in a file.

All of this appears with a user-friendly interface, an uncluttered screen, and logical layout, plus you can customize the features to your liking.

M*LOG is $34.95 with an upgrade price of $15.00 for registered users of LOGMASTER II. Priority shipping and handling is $5 per order. For more information, contact Marshall Emm at 303-752-3362, e-mail him at 75230.1405@compuserve.com, or write him at Milestone Technologies, 3140 S. Peoria Street, Unit K-156, Aurora, CO 80014-3155.

Macintosh Computer Control

Adaptive Systems, Ltd., has announced a radio scanner control program for the Macintosh computer called WAVE. WAVE is designed to control the Radio Shack PRO-2005 and PRO-2006 scanners that have been modified with the Optoelectronics OS456 computer interface, and PRO-2035's modified with the OS535.

WAVE is much like other scanner computer interfaces, allowing the user to set up a search or scan with options to store CTCSS, DCS, and DTMF tone signals, as well as control delay, step, and demodulation. A station log allows entries to be sorted by field and edited while individual frequencies may be locked out of search or scan. All controls can be placed in auto mode, letting WAVE choose the most appropriate settings.

Station logs are compatible with spreadsheet and database programs and can be created, exported, imported, and edited. A chronology of scanner activity can be recorded to a file and is a helpful way to track frequency activity. WAVE can speak the frequency and time of each contact, allowing an audible recording to be made.

The WAVE demo version can be found on AOL in the Ham Radio area and via the Internet at ftp://mirrors.aol.com//pub/info-mac/sci/wave-211d1-demo.hqx. Or, you can write Adaptive Systems, Ltd., 215 Fishing Lane, Wood Dale, IL 60191 or mikeasl@aol.com.

Antiques Price Guide

Have you ever been to an auction, yard sale or flea market and wondered whether you are getting a bargain or a bomb? Few antique guides are as handy, comprehensive and inexpensive as *Schroeder's Antiques Price Guide*, a well-respected collector's bible. Its more than 600 pages contain some 50,000 listings—radios, phonographs, records, tools, toys, bottles, glassware, furniture, knives, jewelry, and more.

Schroeder's guide is only $14.95 plus $2 shipping from Collector Books, PO Box 3009, Paducah, KY 42002.

— BG

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 28902.

Computer Aided Scanning

a new dimension in communications from Datametrics

Now Radio Shack PRO 2006 owners for the first time have access to the exciting world of Computer Aided Scanning with the highly acclaimed Datametrics Communications Manager system. Computer Aided Scanning is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

- The Datametrics Communications Manager provides computer control over the Radio Shack PRO2006 receiver.

- Powerful menu driven software includes full monitoring display, digital spectrum analyzer and system editor.

- Uses innovative Machine State Virtualizer technology (patent pending) hardware interface by Datametrics.

- Comprehensive manual includes step by step instructions, screen displays, and reference information.

- Extends receiver capabilities including autolog recording facilities, 1000 channel capacity per file, and much more.

- Simple 4 step installation - no soldering or modification to normal receiver operations.

Datametrics, Inc

- Computer Aided Scannning system $ 349
- PRO2006 receiver w/interface installed and CAS system $ 749
- Manual and demo disk $15

Requires Radio Shack PRO 2006 receiver and IBM PC with 360K memory (640K for full channel capacity) and parallel (printer) port.

Send check or money order to Datametrics, Inc., 2575 South Bayshore Dr, Suite 8A, Coconut Grove, Fl, 33133. 30 day return privileges apply.

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- o Automatically unblock AR8000, band plan editor.
- o Logs air time, hits, signal, time/date, PL, DTMF & more.
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Equipment Supported:
OS456, OS535, R7100, R7000, R9000, FRG9600, DC440 AR3000(A), AR8000 (EDCO, Opto & AOR I/F supported.).

System Requirements:
IBM PC 386/486/586 with 4 MEG ram, hard disk, VGA, mouse, serial ports. Windows 3.1 or 95. Cables and interfaces for radios may also be required.

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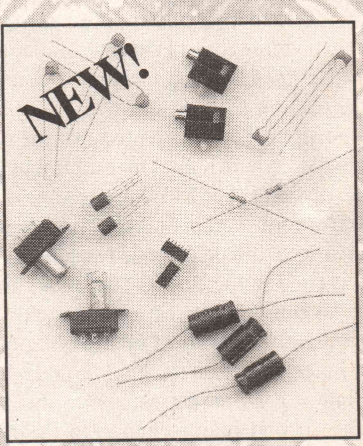

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Optoelectronics Scout Model 40

By Haskell Moore

OPTOELECTRONICS Scout
AR 2700

Other than the designator "Model 40," the Frequency Recording Scout (or just Scout) from Optoelectronics, looks just like the previous Model 25. However, the engineers at Optoelectronics, never content to rest on their accomplishments, have set out to further improve one of the most innovative scanning accessories ever made.

For those who are not familiar with the Scout, it is essentially a frequency counter designed to collect frequencies inconspicuously. Just slightly larger than a digital pager, it can store up to 400 frequencies, along with the number of "hits" on each. It can be programmed to inform the user that a frequency has been intercepted via an audible beep or silent vibrating alert. And, it can be used to instantly tune a scanner to the intercepted frequency via the ICOM CI-V interface port.

Though the outside is relatively unchanged, much of the workings on the inside have been substantially improved. The Scout now has a frequency dithering circuit (patent pending) that performs comparisons of successive measurements. This new circuitry almost completely eliminates the incidence of false readings.

The signal acquisition time of the Scout has also been greatly enhanced. Where signal measurement for three places to the right of the decimal (i.e. 146.765) used to require 6.4 milliseconds, it's now accomplished in only 800 microseconds—eight times as fast!

In order to obtain these fast acquisition times, a different prescaler chip is used in the Scout. This new chip has an upper limit of 1.4 GHz, as opposed to the previous chip that went up to 2.8 GHz. However, this shouldn't be a problem for most scanning enthusiasts, since, other than the 1.2 GHz ham bands, there's almost nothing of general interest above about 900 MHz.

The second major change to the new Scout is the ability to directly interface with the AOR AR8000 and AR2700 scanners (a modification to the scanner is required). This means the Scout now has the ability to Reaction Tune a handheld receiver, allowing complete portability.

By incorporating a single, small cable between the Scout and the scanner, the Scout will automatically tune the receiver to any signal it locks onto. This means that there is finally a way to monitor the local side of trunked transmissions! And not only will it tune to the frequency it most recently registered, but will also tune the scanner to any of the frequencies in memory as you scroll through.

Of course, the Scout still has the ability to Reaction Tune scanners via the ICOM CI-V interface. Switching between the AOR and the CI-V mode requires only a key press when the Scout is powered up.

Though the modifications to the AOR scanners are a bit involved (requiring the partial removal of one of the boards), they aren't nearly as complicated as some of the other scanner modifications I've seen. The Scout owner's manual has excellent detailed instructions for making the modifications. However, those uncertain about tackling the task are admonished to have the modifications performed by a qualified technician. The manual also warns that these modifications may void the manufacturer's warranty, so consider this carefully before proceeding.

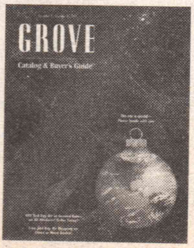
For owners of earlier versions of the Scout, an AOR interface circuit is available from Optoelectronics for $45.

Changes for the Better

Other improvements on the Scout are not as dramatic, but are certainly welcome. For example, one of the features of the Scout is the "sleep" mode, where the user can suspend operation of the Scout, but allow it to retain all captured frequencies in memory. On the previous Scout, it only took a momentary depression of the SLEEP button to put the Scout in this mode, so inadvertent activation was not uncommon. Now, the button has to be depressed for approximately two seconds before it will enter the "sleep" mode.

The battery and charge circuit of the new Scout have also been improved. A more sophisticated circuit helps prevent the battery from being damaged by overcharging. However, if the battery is completely drained, the fast charge cycle (which requires only one hour) may have to be manually restarted two or three times, since the circuit may shut down the charge to protect the battery. The good news is that the battery life has been increased from approximately six hours to ten hours or more before requiring a recharge.

The Scout is manufactured by Optoelectronics, Inc., 800-327-5912 (5821 NE 14th Ave., Ft. Lauderdale, FL 33334). It is also available from Grove Enterprises (800-438-8155) for $449.95.



The Nov-Dec Grove catalog is now out. If you are not on the Grove Enterprises mailing list, call for the free catalog at 1-800-438-8155. For our Internet customers, Grove is offering reduced prices and special package deals on scanners, receivers and accessories. Check out our new World Wide Web site:

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DELTACOMM™ I-7000 communication manager program includes all cabling, manual, UL listed power supply and Delta Research custom CI-V interface for $299.00 + $8.00 (U.S.) or $25.00 (foreign) S&H. The DELTACOMM™ DSS interface upgrade comes complete with easy to follow NO SOLDER installation instructions, all cabling and 8-bit DSS A/D converter module (game port required) for $99.00 + $8.00 (U.S.) or $25.00 (foreign) S&H and is available as an upgrade option to registered I-7000 users. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7100, R71A, R72 and IC735.

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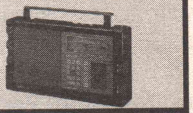

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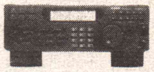

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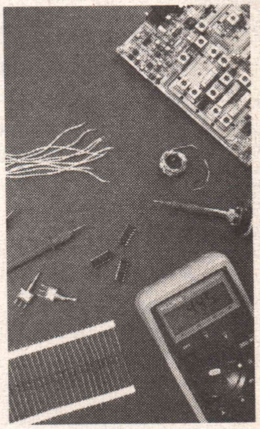
Modifications are available for new equipment at the time of purchase from Grove, as well as for used equipment. Before returning your scanner or receiver for modifications, or if you would like more information about our trade-in service, please call 704-837-7081. Simply explain the type of modification or service you desire. If the requested service is available, Grove will issue you a service order number and advise you of the modification fee and the return shipping charges. Ship your equipment to Grove enclosing a check for the modification and return shipping. A two to three day turn-around time is possible for simple mods requiring no new parts.



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Bob Parnass, AJ9S

Scanner and Equipment Notes

This month, we discuss several products, including the AR8000 portable scanner, a voice recorder option for the AOR AR2700 scanner reviewed last month, and two antennas we use for portable scanners.

AOR AR8000 Portable Scanner

The top drawer AOR AR8000 scanner has been reviewed in most every scanner magazine (see Bob Grove's review in 9/94 *MT*). This is a completely different radio from the AR2700. The features, spectrum coverage, IF, squelch circuitry, descrambler options, and cabinetry are unique to each model.

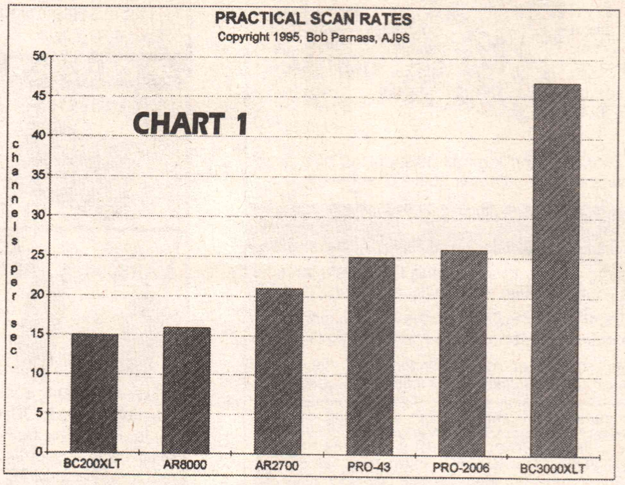
The AOR name appears on the outside of both models. The printed circuit boards inside our AR8000 are stamped "AOR," but the AR2700 boards bear no company name. Moreover, the AR2700 housing bears an amazing resemblance to the Yupiteru MVT-7100.

We won't rehash AR8000 features here. Instead, we borrowed an AR8000, serial no. 021368, and measured scan rate, battery consumption, and modulation acceptance.

The memory scan rate in models like the AR8000 and Uniden BC3000XLT depends on the order in which frequencies and modes are programmed into memory. The scan rate in other models—e.g., the Radio Shack PRO-2006 and PRO-60—is almost constant, regardless of how the scanner is programmed.

The AR8000 literature boasts a maximum scan rate of 30 channels/second, but it is more meaningful to know the practical rate rather than a maximum rate. Our AR8000 scans two linked banks of unsorted VHF-low, VHF-high, and UHF frequencies at 16 channels/sec—slow, by contemporary standards. Our similarly programmed BC3000XLT scans three times faster, due, in part, to its automatic sorting of frequencies.

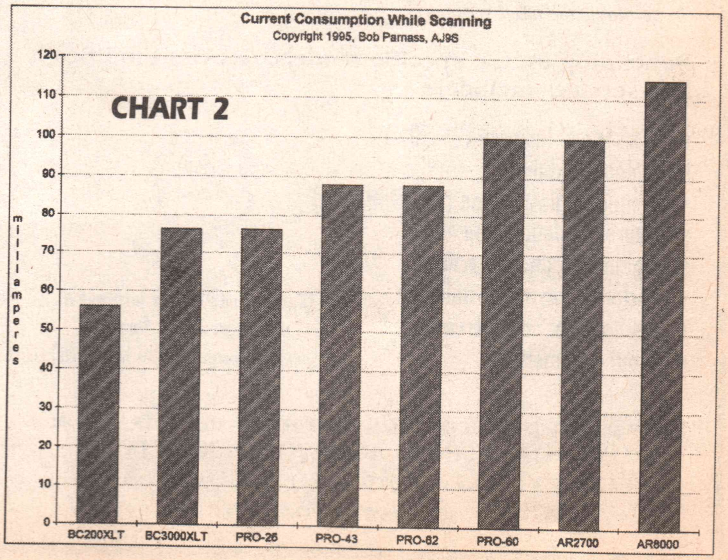
The AR8000 manual recommends that frequencies within the same band and mode be grouped in the same bank to obtain the fastest scan rate—an inconvenient arrangement. We are able to attain a rate of 25 channels/sec after programming 860.0 MHz NBFM into 50 consecutive channels, an impractical configuration. The measured scan rates for other models are compared in Chart 1.



Last month, we found the AR2700's insensitive carrier squelch a major shortcoming, causing the AR2700 to skip over weaker signals. The AR8000's noise-operated squelch is much better behaved. On 160 MHz, our AR8000 squelch opens on signals below 0.2 uV in strength where our AR2700 squelch requires a 0.4 uV signal to open: a 6 dB difference. The gap widens to almost 16 dB at 460 MHz, where the AR8000 squelch opens on signals weaker than 0.1 uV in strength but the AR2700 squelch requires 0.6 uV.

Spot checks show our AR8000 to be very sensitive on parts of the VHF-low and UHF bands, better than 0.12 uV for 12 dB SINAD.

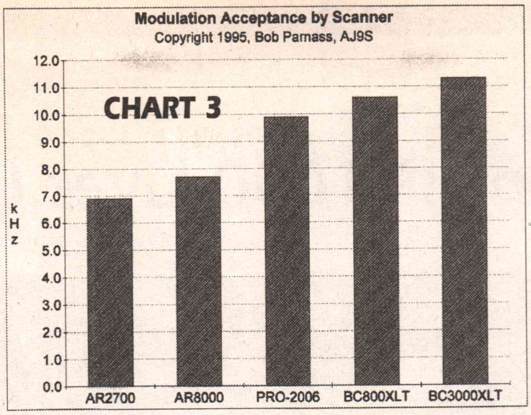
Our AR8000 consumes 115 mA while scanning or in manual mode, and that's a lot of current when compared with other portable scanners (see Chart 2). Current consumption rises into the 115 - 175 mA range while receiving signals at various settings of the volume control, compared with readings of 100 - 130 mA in our AR2700.



The keypad and display backlighting are excellent but require an additional 106 mA, 77% more than the AR2700. The AR8000 won't run the batteries down when it's turned off because it consumes virtually no current. We didn't measure the power consumption in the Power Save mode.

Modulation acceptance is a measurement which predicts how a scanner will perform when receiving overmodulated or slightly off frequency signals. If the modulation acceptance is too narrow, the audio from an overmodulated or off frequency signal is apt to sound fuzzy or even force the squelch closed on voice peaks. Most land mobile FM signals employ 5 kHz deviation, but some signals may be a bit wider. Therefore, it's best for a scanner to have a modulation acceptance of at least 6.5 or 7 kHz.

Modulation acceptance measurements for several scanners are compared in Chart 3. Our AR2700 and AR8000 are apt to be less tolerant of off-frequency and overmodulated signals than the other models tested, although we didn't have this problem while monitoring actual signals during the trial period.



RU2700 Recorder Option

How often have you been distracted at the same instant that something interesting is being broadcast over your scanner? Many public safety dispatchers have continuous recording facilities available so that they can replay such missed transmissions. It would be great to have a free-running, voice-activated, "endless loop" recording feature which could replay the last 15 or 20 seconds of traffic your scanner heard but you missed.

The RU2700 recording option for the AR2700 is a first step in that direction, but it falls short. When fitted with the RU2700, the AR2700 starts recording audio at the press of a key. The S-meter indicates how much of the audio memory is used and recording stops when the recorder's 20 second memory is full. The audio can be played back at the press of another key.

The recorder is just barely integrated into the AR2700. The RU2700 records white noise in between transmissions even though the receiver is squelched. This is annoying and wastes recording memory, too.

The instructions furnished with the RU2700 recommend installation in the AR2700 be "carried out in an experienced specialist receiver workshop." It took us 30 minutes to install the RU2700. There is no soldering involved; most of the work is disassembling and reassembling the AR2700.

First, the case back must be removed. Then the IF board must be freed, a job which requires removing the three knobs and the locking nuts holding the controls to the top panel. The AOR instructions recommend using a long nose pliers to remove the nuts because they are recessed, so an ordinary nutdriver or combination wrench just won't do. Be careful—one slip, and you've gouged the top panel.

Once disassembled, you can install the optional DS2700 speech inversion descrambler, too. Reassembly is the reverse procedure, although we had to use a needle nose pliers to position the tiny screws in the battery compartment for reinsertion.

We are still trying to determine a good use for the RU2700 recorder. There is no "endless loop" mode, and one never knows when to start recording.

Portable Antenna Alternatives

This reviewer is often asked to recommend alternatives to the antennas supplied with portable scanners. The rubber-covered, spring antennas furnished with older scanners, like the Electra/Bearcat Four-Six and Radio Shack PRO-30, were fairly flexible, but the antennas furnished with today's scanners are too rigid and stress the antenna jack.

Except when performing product reviews, we rarely use the stock helical antenna and prefer an ICOM FA-1433B dual band flex antenna instead. We install a Smiley Antenna telescoping Thin-Stick for longer range. Although both are marketed to ham radio operators, we've used them on portable scanners and VHF/UHF walkie-talkies alike. We don't have test data to present but both antennas are worth recommending.

ICOM FA-1443B Flexible Antenna: The ICOM FA-1443B is a flexible, base-loaded antenna supplied with many of ICOM's 146/440 MHz dual band walkie-talkies. At first glance, it resembles a 450 MHz, quarterwave, rubberized antenna with a lump at the bottom, but the FA-1443B works much better on VHF-high band than a simple UHF quarterwave antenna.

It consists of a BNC connector fitted to the bottom of a coil, followed by a 5-1/4 inch thin, rubberized "rat tail" element on top. The FA-1443B is slightly taller than a stock antenna—about 8 inches overall, but the rat tail portion is far more flexible.

The FA-1443B lists for about $21 and is available from Amateur Electronic Supply, 5710 W. Good Hope Rd., Milwaukee, WI 53223, tel. (800) 558-0411.

The Thin-Stick: The "Thin-Stick" is a great little telescoping antenna made in the USA by Smiley Antenna Co., Inc. When fully extended, the 18-inch Thin-Stick functions as a quarterwave antenna on the 2 meter ham band. By collapsing various sections, it will cover a wide range of frequencies. The Thin-Stick is about 6-1/2 inches tall when fully collapsed.

It's no secret that quarterwave telescoping antennas (TAs) work better than the rubber-covered helical antennas supplied with portable radios. Telescoping antennas have been prone to damage due to their rigid construction. They can be permanently bent, or they can break the antenna connector right off a radio if accidentally pushed against an object.

What makes the Thin-Stick different is a rubber-covered spring between the antenna and the connector portions, which absorbs most of the impact if the antenna collides with an object. The construction is very good, and our Thin-Stick looks brand new after seven years of use.

Thin-Sticks are available with a BNC or other style connector. Street price is about $17 and they are available from Amateur Electronic Supply, Milwaukee, and other retailers. You can buy a Thin-Stick directly from the manufacturer, Smiley Antenna Co., Inc., 408 LaCresta Heights Rd., El Cajon, CA 92021, tel. (619) 579-8916.

CORRECTION

In the September column we stated that an evaluation sample of Radio Shack's new PRO-60 scanner showed a small amount of current drain after shutoff. A spokesman for GRE, the manufacturer of this scanner, informed us that this was impossible since shutoff disconnects the power supply. To confirm this, a second PRO-60 was tested; there was no current drain following shutoff in the second sample.

The earlier measurement might have gone awry, but a review of the test procedure suggests that the first unit, long since returned to the dealer, might have been defective. User feedback indicates high satisfaction with the new scanner, and the new PRO-60 has the least residual current drain on the marketplace: zero! We appreciate GRE calling this to our attention.

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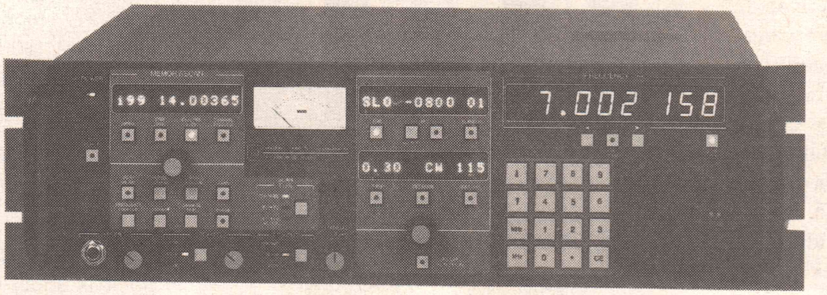
MAGNE TESTS

SHORTWAVE EQUIPMENT REVIEW

Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

Watkins-Johnson HF-1000 Lives Up to Promise



On paper, the Watkins-Johnson HF-1000 is a real tempter: $4,000 worth of professional-level receiver, yet one that's aimed specifically at shortwave enthusiasts. And it comes festooned with all sorts of controls to tweak signals to their full potential.

However, when we tested it last year, what we found was profoundly disappointing. In effect, the receiver was put on the market only part way through its R&D process, and it showed. Not only were promised functions absent, but audio quality was virtually intolerable. Shortly thereafter, *QST* came up with comparable findings.

The good news is that in the intervening year or so, W-J has seen fit to improve matters. The bad news is that this model seems to be something of a spare-time effort at W-J, whose discreet clients are usually located at such sites as Langley and Alexandria, Virginia, or Fort Meade, Maryland. In effect, when W-J has engineering time to spare from government applications, they work on improving the HF-1000. (Or, if you're cynical, getting accomplished what they should have done in the first place over a year ago.)

Good for spooks, but what about us?

Watkins-Johnson, under its own name and a variety of here-and-gone fictitious rubrics, is a long-time supplier to the military and spook trade. An assumption commonly made is that these sorts of clients, with their deep pockets and rigorous requirements, will spring only for the very best: therefore, DXers who can afford it should be better off using professional-grade communications gear.

It's not that simple. First off, certain requirements of government agencies differ from those of shortwave broadcast DXers and listeners. Second, the "clubby" nature of government procurement, especially under the cloak of security, may result in costly gear with suboptimal performance.

Given this, what we found last year was not surprising—even though the HF-1000 is a spinoff from a receiver made to replace the SWL-oriented ICOM IC-R71A. With the end of the Cold War, W-J decided to sell the HF-1000, a variant of this model, to the public.

Current version improved

Because W-J improves the HF-1000 as time permits, this means that individual units often perform differently from each other. The version of the HF-1000 tested (we obtained two new units: one from Universal Radio, the second from W-J) incorporates welcome hardware changes—a redesign of the receiver's motherboard and back panel—and ROM upgrades to the software which controls the receiver. Yet, even though the two units were manufactured within a few weeks of each other, the back-panel changes differ.

However, some long-promised features, such as passband tuning and selectable-sideband for the synchronous detection, are *still* not on the current version. (Oops, make that on the version we tested. Perhaps by the time you read this, it will have changed yet again!)

Lab measurements commendable

Our laboratory measurements confirm that this receiver is no slouch. Bandwidths have a razor-sharp shape factor of 1:1.3; other top-notch scores in our lab are in image rejection, dynamic range/TOIP, stability and overall distortion above 1000 Hz AF.

The many remaining measurements of performance come out as good or excellent, except for overall distortion at 200 kHz AF and below. The AGC threshold, as on many military receivers, is so low as to make the set less quiet than it otherwise would be; and there is more synthesizer phase noise than is appropriate in a receiver of this caliber.

Withal, it's a strong showing, notwithstanding that some of our tests, such as for dynamic range, are of the worst-case variety, and thus give less cheerful numbers than those from the manufacturer.

Digital hash reduced

One problem that has been improved upon in the tested version is internally generated digital hash. W-J has had no prior experience in the consumer market, so it designed the HF-1000, as it does its other gear, with little concern for radiated digital hash. That's because their normal clientele routinely uses heavily shielded antenna lead-ins, which minimize the likelihood that such hash will be picked up by the antenna configuration. Alas, this is difficult to cure, but they gave it a stab, and the new version is better in this regard.

A suitable passive outdoor antenna having a well-shielded coaxial feedline (the Alpha Delta "DX-Ultra" does especially well), usually eliminates the problem completely. Active antennas, however, fare more poorly. Even if they use good coax and a remote receiving element, their amplifier boxes are usually not shielded well enough, especially if they are located near the receiver.

But that's not all. A second form of hash is generated and picked up within the receiver, and thus can't be eliminated by the user. This is less of a problem than it was in earlier versions, but there are still annoying traces on some discrete frequencies, especially in the higher bands. Fortunately, this noise is not strong enough to affect DX performance. Unfortunately, there's no excuse for rubbish like this to be even faintly audible.

Audio much better...

The exceptionally harsh, tiring audio in the version we tested last year has been much improved. It is now generally pleasant, especially when the synchronous detector is switched in and an appropriate external speaker is used. The audio is now good enough for enjoyable listening to programs, although the Lowe HF-150 also does a commendable job in this regard for a fraction of the price.

▪ ...and simply top-drawer with SE-3

Before we gave up on this, though, we obtained a Sherwood SE-3 fidelity-enhancing accessory from Sherwood Engineering, Inc. (1268 S. Ogden Street, Denver, CO 80210). This latest version of the venerable SE-3 is designed to improve the fidelity of many models of tabletop receivers, and in the case of the HF-1000 connects simply by plugging it into the receiver's IF output port.

The result is a significant improvement for program listening. Indeed, some of our panelists felt it provided the best quality audio they had ever heard on shortwave!

Sherwood Engineering ordinarily recommends the Radio Shack Optimus 7 speaker to be used with the SE-3, which works with a wide variety of receiver models. However, we found that various other high-efficiency mini-speakers from audio outlets, as well as certain amplified speakers from computer stores, sound better than the Optimus 7 when mated with the HF-1000/SE-3 combo.

With the SE-3, synchronous lock is held superbly, just as it is on the 1000's top-drawer synchronous detector. But the SE-3 also provides other pluses, including continually tunable, if somewhat "stick-shifty," selectable sideband, which is exceptionally effective in reducing adjacent-channel interference.

Combined with the vast arsenal of highly selective bandwidths—the HF-1000 is untouchable in this regard—the HF-1000/SE-3 combo does more than any other receiving system we have tested for trashing the curse of adjacent-channel interference. The nigh-limitless mix of offset choices and bandwidths also helps shape audio tonality, with the SE-3's effective treble-cut switch further helping in this regard, especially with static.

However, there's no free lunch. To obtain this almost-*ne plus ultra* in audio quality, you have to add around $500 for the SE-3 and maybe $100 for a speaker. And although we found the SE-3 to be relatively intuitive to operate, it introduces yet more controls. While this further complicates operation, it fits in with the HF-1000's orientation to manual control of reception variables, so our busy-fingered panelists were comfortable with the arrangement.

RADIO DATABASE
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reports contain virtually everything found during exhaustive tests of premium shortwave receivers and outdoor antennas. For a complete list, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

▪ Some harshness still audible

The HF-1000/SE-3 combination produces an exceptionally high caliber of audio quality. Most panelists feel it is the best, period; a couple don't. Yet, all agree it isn't what it could be. The HF-1000 still makes static and adjacent-channel modulation penetration sound harsher than on other top-rated receivers.

Why? To begin with, when nonlinearity ("overloading") takes place within digital circuits, the result is more of a complete breakdown in quality than it is with equivalent analog circuits. A higher sampling rate would help, as would improved AGC. W-J chose the simpler AGC route in the version most recently tested. While this reduces the instances of nonlinearity, it doesn't eliminate them. Ergo, the sudden and disconcerting bursts of harsh audio.

Too, the vertical selectivity skirts so beloved by engineers can actually degrade audio fidelity, at least on FM. In principle, the HF-1000 may be suffering from this syndrome, although there's no practical way for us to test for this in the laboratory. These aural annoyances can be softened slightly by adjustment of the AGC controls, which may be set to one of three predetermined decay rates, or switched off for manual regulation.

▪ Options available

The HF-1000 may be equipped with an optional inboard preselector for improved resistance to false signal generation. Within North America, we've found no real need for the preselector, although having it can't hurt. However, in high-signal parts of the world, such as Europe, North Africa and the Near East, go for it. If in doubt, remember that you can always add it later—it's a relatively simple component to install.

W-J reportedly hopes to offer digital audio processing for improved quality of reception, including automatic attenuation of heterodyne interference. Apparently the hangup is price ($900 has been mentioned), but those interested should contact the manufacturer for details.

▪ First-class receiver, ahead of its time

What does this mean in the real world of deciding what to buy, and when?

The revised HF-1000, warts and all, is now enough ahead of its analog counterparts that it is unlikely to be equaled or outclassed anytime in the near future. Too, upgrades are often made available to existing owners, allowing the HF-1000 to be state-of-the-art for longer than conventional models.

For DXing and SWLing alike, there is no such thing as an "ideal" receiver, but the Watkins-Johnson HF-1000 is at least as good as the best the competition has to offer.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

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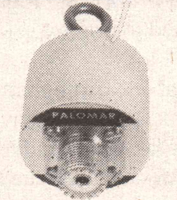

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COMPUTERS & RADIO

RADIO-RELATED SOFTWARE REVIEWS

John Catalano, PhD

The Mailman Cometh

Basic control theory says that in order for any complex system to remain stable and functioning correctly, a feedback loop is required. Feedback is defined as some of the output being re-sampled at the input.

For me, this important function is provided by even more important people...YOU, my readers. Therefore once again I have superglued my disk and cd-rom drives closed for a short time while we "read the mail" (a ham term for monitoring a conversation) together. We've covered a lot of topics in the past few columns and your letters reflect this wide range. Let's get going before the mailman gets here and brings me more.

Alternative Systems

On the subversive subject of non-IBM compatible computers, Phil Teders of Florida wrote in asking about radio-related software for Macintosh users. Sorry, Phil. The closest I ever came to owning a Mac is a program called Aladdin for the Atari 16-bit ST. This allowed the ST to run Mac programs ... at least in theory. I tried to run my ICOM R-71 with little success.

Phil asks about a program called "Soft Windows"—an IBM emulator, and about the existence of Mac-based radio control software for the AR-3000 and the NRD 535D.

Phil, I suggest you and other Mac users check with Jim Frimmel, the author of SW Navigator which drives the NRD-535 and provides a frequency database, among many other features. His address is 232 Squaw Creek Road, Willowpark, TX 76087, or, since he is on the *MT* staff, you may write him through the magazine. He does manage a file upload area on the Grove Bulletin Board for Mac programs, and is available by e-mail at DXComp@aol.com, as well.

AEA's MacRATT software package allows the ubiquitous PK-232MBX Morse, RTTY, FAX, AMTOR, and Packet decoder/encoder to be used with the Mac. Check with AEA distributors in your area for price and availability.

I have seen ads for Mac shareware. SunClock is a world clock program. Skycom is a propagation tool. Check *Computer Shopper* magazine for Mac program suppliers. Also, on the CD-ROM disk "QRZ! -Volume 4" there exists a file named QRZ_MAC.HQX.

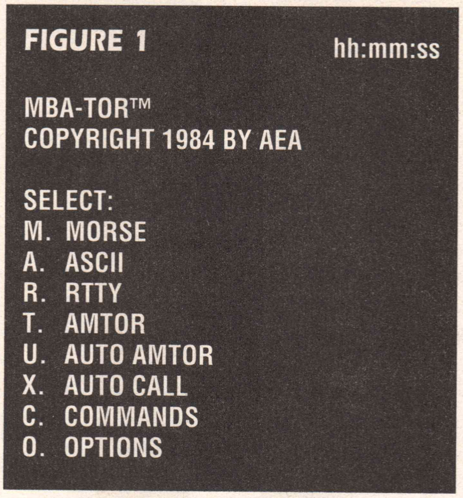

FIGURE 1

```
                         hh:mm:ss

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SELECT:
M. MORSE
A. ASCII
R. RTTY
T. AMTOR
U. AUTO AMTOR
X. AUTO CALL
C. COMMANDS
O. OPTIONS
```

Although the CD's instructions don't make any mention of it containing Mac programs, it could be worth checking out.

Oldies and Still A-Roundies

Speaking of alternative systems, I sometimes reflect in wonderment at the great times I had on my Atari 800, Sinclair Spectrum, Tandy 100, Apple II, and the venerable Commodore C-64, to name a few. They have limited memory and only eight-bit processors, but they are still capable of running some useful, entertaining, and exciting programs. Here are a few of my favorites:

MBA-TOR (AEA): This decoder/encoder of AMTOR, RTTY, CW, and other modes was available over a decade ago. The powerful program still performs amazingly well for ham band monitoring and strong utility stations. Figure One shows the main screen of MBA-TOR. Notice all the modes it covers; check out the copyright date! It allows logging of decoded messages and many other features as shown in its option screen in Figure Two. A decode only version called SWL-TEXT is also a variation that is worth having.

Ballblaster (Lucas Films): This fast-playing, three dimensional, split screen, head-to-head, soccer-type game still increases pulse rates and induces sweating in all who play. Regardless of what computer you use today, this 8-bit program will amaze you. Try it to see how much 64K of memory can do in the hands of professionals.

Flight Simulator (Sublogic): the grandaddy of all flight simulators. It has chunky graphics by today's standard, but is still a useful tool in teaching air navigation and basic aircraft handling concepts.

Doctor DX (AEA): This simulation allows the user to "tune" a computer transmitter/receiver and copy Morse code signals. The program takes into account the season, time of day, frequency, and geographic location of possible signals. Finding a DX signal in a pile-up is so rewarding you have to keep reminding yourself it's not real. A simple, but effective use of artificial intelligence concepts, and in an 8-bit machine with 64K of memory.

When I think about these programs, their performance never ceases to amaze me, even when sitting in front of a 50 MHz 486 DX—or especially then. For the price of a sound card a working C-64 can be purchased, usually with software. A word of warning: be prepared for many minutes of program loading and saving. How quickly we forget!

Well, it seems I'm not the only one with these feelings. According to a letter and a Charlotte *Observer* news article sent to me from Michael Barnette of North Carolina, C-64s are alive and well in Pinellas Park, FL. There, as in other locations across the country, a very active C-64 club meets weekly and is "... keeping the original home computing spirit alive." One member even reports that he has used his C-64 with his ham radio. The unique thing about this group is their average age is well over seventy! Long live hackers! Good luck to all those trying to swim against the computer standardization tide.

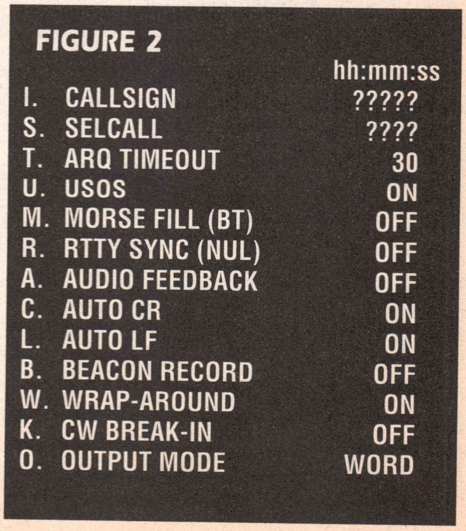

FIGURE 2

```
                         hh:mm:ss
I. CALLSIGN                 ?????
S. SELCALL                   ????
T. ARQ TIMEOUT                 30
U. USOS                        ON
M. MORSE FILL (BT)            OFF
R. RTTY SYNC (NUL)            OFF
A. AUDIO FEEDBACK             OFF
C. AUTO CR                     ON
L. AUTO LF                     ON
B. BEACON RECORD              OFF
W. WRAP-AROUND                 ON
K. CW BREAK-IN                OFF
O. OUTPUT MODE               WORD
```

Internet v Radio Hobbies

Well, it is not exactly Rowe v Wade, but it's also drawing lots of heated opinions. If you saw Bob Grove's editorial a few months ago, you'll know that even he has been drawn into the debate (and many of your responses to that were aired in last month's "Letters to the Editor").

To refresh your memory, in a past column I related the story of a staunch, thirty-year radio communications fanatic who has forsaken the radio spectrum for the Internet.

Reader Eric Forslund of New Jersey wrote me with some very interesting observations on the subject. Eric says, "I am very active on the ham bands, both phone and the digital modes, AND I give my 14,400 modem a thorough workout, but for different reasons." He makes a very real observation that ham radio and hobby radio communication are not only about communicating: "... it is an exercise of science and operating skill."

He feels that making a radio contact (or monitoring a target) is an achievement of the operator's knowledge of equipment, understanding of propagation, antenna optimization, greyline influences, and many other subtle subjects. Add to this a good measure of perseverance. He goes on, "When I connect via modem, it is for some specific information, program or inquiry...I am dependent on people (companies), as opposed to nature, for my connection."

Eric, you have succinctly re-captured the original reasons and feelings of radio experimenters and hobbyists of the 1920s, 30s, 40s, 50s, and 60s. No one would question that telegraph and/or telephone communication was already very well established. But as you point out, the "thrill" was the freedom of "going-it-alone." Before equipment technology became as complex as it is today, "home-brewing"—making your radio equipment from parts and circuits—was the essence of total personal achievement. Perhaps we have jumbled up these two distinct, and quite different, motivations: one for communications and the other for personal, self-actualizing challenges.

Now I can hear utility station monitors saying, "Oh yeah! Easy for him to say." There is no question that, since people who are in the business of communications are switching to other methods and modes, utility monitoring is also becoming a challenge in its own right.

James Snow of Kentucky has other perspectives on the subject: cost and long term reliability. Jim points out the relatively short operational history of most computer systems when compared to other consumer products such as cars or even long-running SWL receivers. On that one, Jim, only time will tell. But I think that the electronics industry and major software manufacturers plan to capitalize on our culture's preoccupation with having the latest and the best of everything. On the topic of money, Jim expresses his opinion that the idea of paying a monthly fee for the Internet "rankles."

I want to thank everyone who contributed to this month's column—and also to all of you who have written to me with information, opinions, questions, or just to say you like what you read. Although it may take a bit of time, I answer the topics or questions of every letter, either in the column or via your enclosed SASEs. Beside enjoying reading your comments and opinions concerning topics we have discussed, your letters provide a direction for future columns. If you have a computer and radio-related problem, you are probably not alone. Let me know so we can share the solution, or at least the pain, with our readers.

There is no question that people around the world are embracing computers and the Internet as a new form of entertainment and social outlet. Recently, as I was driving home at dusk and was stopped at a traffic light, I noticed the occupant of a home staring at a glaring screen. "Someone watching the evening news on TV," I thought.

At one time, I could have correctly assumed that; this time, in fact, it was a computer screen. To my amazement this scene was repeated at the very next traffic light! No, I am not in the habit of being a "peeping Tom." But technology has brought me to many strange situations in my career. I have discovered that a distant (very distant) relative met his new fiancee over the Internet. As his 73-year old mother said to me in a perplexed and puzzled way, "Gee, couldn't he have just found a nice girl at a local club?"

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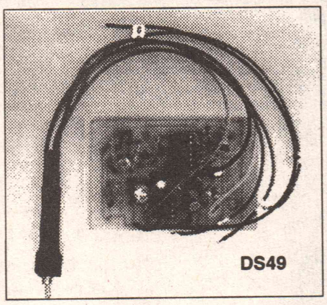

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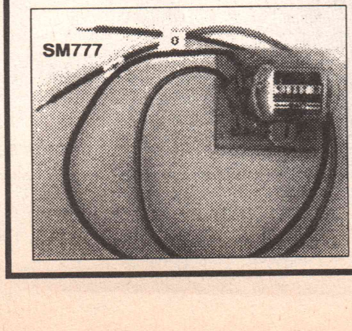

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DEMAW'S WORKBENCH

CONSTRUCTION PROJECTS AND TIPS

Doug Demaw, W1FB

Using the MFJ-259 Multipurpose Tester

How many times have you said, "I'd build radio equipment if I could afford the mountain of test equipment that's required?"

It's true that good test gear is expensive if it is purchased new. Fortunately, the average experimenter need not have wall-to-wall lab apparatus in order to properly test a home-made project. In the old days most of us had only some hand tools, a VOM (volt ohmmeter) and a roll of tape. Yet, we turned out some pretty impressive equipment!

MFJ Enterprises, Inc. manufactures a truly neat gadget that is several pieces of test gear in one small box. It is called the model 259 SWR Analyzer. If a builder had individual pieces of test gear that handled all of the functions of the 259, he or she could easily invest $1000 for the collection. Furthermore, all of those units would occupy a lot of workbench space.

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MHZ

What Can We Do With the MFJ-259?

Precision antenna matching and adjustment can be accomplished quickly and easily with the 259. There are two meters on the front panel. One reads the antenna SWR (standing wave ratio) and the other one indicates the feed-point resistance of the antenna. It is not necessary to use a transmitter to check the SWR, because the instrument has its own built-in mini transmitter, or oscillator. The operating range of the 259 is from 1.6 through 170 MHz, so even VHF antennas and circuits can be analyzed with ease.

The foregoing function will allow you to tune your short-wave or amateur antennas for top performance without guesswork or the old cut-and-try method. You can also adjust your antenna tuner precisely while observing the meters on the 259.

The operating frequency of the instrument is displayed by means of an LCD (liquid crystal display) readout on the front panel. A band switch enables the user to select the desired frequency range, and a continuously variable frequency control is used to select a precise frequency within a chosen band.

Since the MFJ-259 has its own oscillator that is continuously variable from 1.6 to 170 MHz, the user may utilize the instrument as a high accuracy signal generator. Again, the operating frequency is presented on the LCD display.

More Neat Features

We have already learned what two of the test features for the MFJ-259 are. A third option is to use the instrument as a 1.6 to 170 MHz frequency counter. This important function makes it possible for you to test home-made oscillators and VFOs for their frequency of operation and drift (frequency stability). You can also use the counter to check the output frequency of a transmitter, and to adjust crystal oscillators in older CB and amateur gear to their desired frequencies, if they have trimmers for "netting" the crystals.

If you really want to get sophisticated with the 259 you can determine coil inductance by following the easy instructions in the operating manual. Likewise for unknown capacitance. So, this feature provides instrument no. 4!

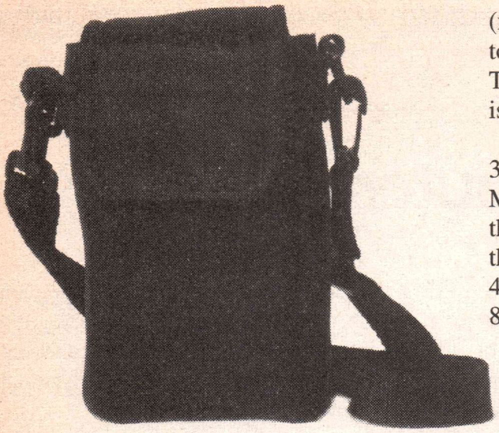
There's still more to this story. You can determine the impedance of factory-made or home-made open-wire feed lines with the 259. In a like manner, the loss in coax cable can be measured. If you need a quarter-wave coaxial transformer for antenna impedance matching, you can use the MFJ-259 when trimming the line section to its precise length. The manual explains all of this in layman's language.

Broadband transformers may also be analyzed for their impedance-transformation ratios with this tester. This is especially handy when winding your own toroidal transformers and baluns.

Do You Need a Dip Meter?

Still another function (and one more instrument at your fingertips) is the dip-meter feature of the 259. Two accessory plug-in coils (MFJ-66) are available at modest cost for converting the 259 to a 1.6 to 170 MHz dip meter. This function allows you to check antenna traps, tuned circuits, and antennas for their resonant frequencies. Today, a quality dip meter can cost as much as the MFJ-259.

I find that having an accurate digital frequency readout on a dip meter is pure delight. With the older analog dippers it was necessary to obtain the dip in meter reading, then listen for the dipper signal with a receiver in order to know the exact frequency at the dip. This is because the analog frequency readout on older dippers is approximate, at best, and because the dipper oscillator frequency will shift somewhat at the dip because of what is known as "pulling."



MFJ-29 carrying case.

Powering the MFJ-259

You may use ordinary alkaline batteries for powering the instrument. Alternatively, you may purchase the MFJ plug-in wall transformer that works with most of the MFJ equipment. I use the power supply from my MFJ Super DSP Filter. The 259 isn't fussy about its operating voltage. You may use any dc source that provides output from 8 to 18 volts. The power supply must be able to accommodate a current drain of 200 mA. The MFJ-1312B plug-in supply is available for $12.95 as an accessory item. Battery operation is desirable when working in the field with antennas. Otherwise, an ac-operated dc power supply is recommended.

Some Closing Comments

This has been a departure from my usual column format, but I became so impressed with the MFJ-259 as a workbench instrument that I wanted to share the information with you. I have found the quality of the product to be excellent (I'll admit I was skeptical), and it does everything that is detailed in the operating manual, a copy of which is free on request.

One fault I will mention is that this product, like other MFJ merchandise, is supplied to the customer without a schematic diagram. This makes home repair virtually impossible, and requires sending a defective unit back to the factory for service. I don't know if a circuit diagram is available for a fee, but I intend to inquire.

For those who wish to use the MFJ-259 for field use, the company offers a padded carrying case (MFJ-29, $19.95) with a shoulder strap. This may be used to protect the instrument from scratches and dings during transport. The LCD display and the two control knobs are accessible through holes that are provided in the padded case. My second criticism is that the band switch hole in the case (for that control knob) should be made larger to permit reading the frequency-range label. This label is not visible when the instrument is in its case.

The MFJ-259 measures (HWD) 7-1/2 X 3-3/4 X 2-1/2 inches. The price class is $220. An MFJ Enterprises catalog, information about the MFJ-259, and the unit are available from the manufacturer, MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762. Phone 800-647-1800 when ordering.

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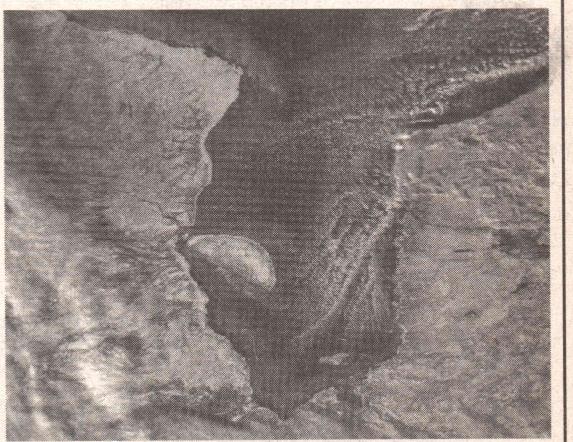

HRPT Image of southern Hudson Bay

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Building & Upgrading Computers—Part 1

Close your mouths, dudes 'n dolls—yes, you can build and upgrade computers! In times past you had to be some kind of a wizard, but not any more. Now, you need little more than the ability to read simple instructions and use a few basic hand tools like screwdrivers, nut drivers, wrenches, and maybe a voltmeter.

As a radio experimenter, chances are you already have the tools and most of the basic gumption and grit that it takes to do it the first time. As a radio experimenter, chances are that you already have a computer but may need another or a more powerful one. You can do either at a substantial cost savings while you reap the immense reward of education and chutzpah.

Building computers is no longer a highly technical electronic job. It's a mechanical, logical, step-by-step process where the chances of something going wrong are not much worse than that of assembling a bicycle or a child's toy. If you break something, replacement costs are usually very low. Complexity is not a concern if you are prepared in advance—that is, mentally rehearsed with handy tools, a place to work, and a bit of reference information at your fingertips.

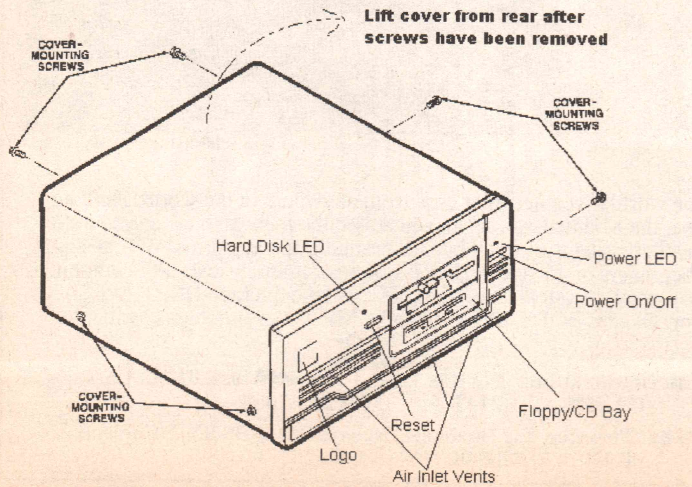
If the closest to a computer you've ever been is an electronic calculator, then you will need a modicum of general IBM/compatible experience and a book or two on personal computers before launching the adventure. On the other hand, if you have used an IBM/compatible computer of AT/80286 class or better for any length of time, then you might already be prepared to tackle a serious upgrade or even to roll your own precision computing machine from scratch! It's that or buy your machines ready-made. Either way, radio and computers have now joined at the hip and are not likely to ever disengage.

The scope of this non-technical series for radio experimenters is to lay out an overview and a process for upgrading and building a modern PC/compatible computer of 80386 or 80486 caliber. The seemingly infinite number of uncertainties about computers can bewilder and stifle would-be adventurers. If you are in this huge group, sit back for a good read and file this issue away for further reference. If you think you are not ready for this exciting trip, relax: you may be ready in only a few months. Believe me, upgrading or building a computer is within your grasp. Familiarity with the mechanics of the machine is the primary prerequisite.

Get Familiar

That's right—get acquainted with that "thing" that's awed you for so long. There are a couple of ways to get acquainted with a computer: If you already have one, take it apart! A good excuse is to clean the darned thing. Just pop the case and give it a good vacuuming and dusting, and then while you're in there, you can snoop around. You don't need to make a commitment to touching the critter at this time. Just vacuum and dust it out and look around. See Figure 1 for a diagram of what you're most likely to find on the outside and Figure 2 for a view of the typical innards of these bluff-and-bluster beasts.

FIGURE 1: External View of a Typical PC



If you don't have a computer yet, or even if you do, there are a couple of very good books that won't set you back a fortune, but can pay off handsomely for the educational and reference value alone.

References

Upgrading and Repairing PCs, 4th ed; Scott Mueller; pub Cue Corporation; ISBN: 1-56529-932-9

Build Your Own 80486 PC And Save A Bundle; Aubrey Pilgrim; pub TAB Books; ISBN: 0-8306-8628-2

Actually, TAB Books has a series of books by Pilgrim, "How To Build Your Own..xxxx.", any of which can serve as a reference. My favorite is the *Upgrading and Repairing PCs* but it's definitely a reference treasure and not meant to be read in a leisure sitting. It is a "bible" for computer experimenters and tinkerers, though.

Making Friends

You don't need these books right now if you're careful and a little adventuresome. Just use Figures 1-3 as roadmaps and make friends with your computer. Here's what you're going to find in more modern machines (AT/286 & up):

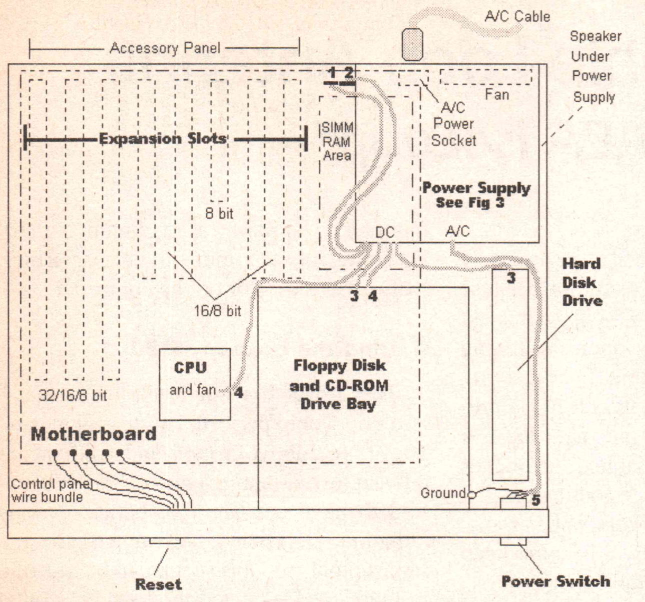
The Case

There are five common case styles, the most popular being the "desktop" style shown in Figure 1. There is another smaller desktop style, typical of some IBM PS-1 models and most Radio Shack models. Then there are three sizes of "tower" cases: mini, medium, and large. The mini tower case is almost exactly the same size and shape as the larger desktop case if stood on end.

Internal layouts and configurations are much the same, too. The medium and large tower cases also follow the internal layout of the desktop case, with exception of having room for more floppy, CD, and hard drives, as well as larger power supplies.

All covers are easy to remove, typically with six screws, though some may have only one! There is no danger to removing the cover, neither to the equipment nor to the person. Dangerous high voltages are con-

FIGURE 2: Inisde View of a Typical PC


A/C Cable
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Power Supply
See Fig 3
8 bit
DC
A/C
Hard
Disk
Drive
3
3 4
16/8 bit
CPU
and fan
4
Floppy Disk
and CD-ROM
Drive Bay
32/16/8 bit
Motherboard
Control panel
wire bundle
Ground
5
Reset
Power Switch

tained within the sealed power supply unit and cannot be readily accessed except at the main power switch.

Covers lift or slide from a frame structure that separates it from the electronics inside. Remove the AC power plug from the back panel before lifting the cover to ensure absolute safety. Incidentally, a new case and power supply usually costs well under $100.

The Power Supply

Generally blocking both view and handy access is a sealed metal box, usually in the right, upper, rear corner of desktop cases, and at the top of tower cases. This is the power supply, typically measuring about 6"W x 51/2"L x 3"H, though there are larger sizes for the large tower cases to accommodate heavy duty computers.

Computer power supplies vary in wattage rating, from as low as 100-watts to 400-watts or more for the heavy duties. A typical power supply for "all occasions" is about 150-watts and costs well under $50. Larger ones are nice, but can be overkill, both in price and in size. Power supplies contain a built-in 3-1/8" square cooling fan and a recessed A/C power receptacle to accommodate a standard 3-prong computer power cable. Despite the wattage variables, power supplies are all alike with pretty much standard mounting holes and flanges.

Get acquainted with your power supply by removing it from the frame! Just loosen and remove four screws from the rear panel and maybe two more screws on the inside mounting flange, after which it will slide or lift out the side. No need to disconnect any cables for now. Just to remove it is enough, and while it is out, vacuum it. Hold the vacuum hose against the fan port and then against all other slots and openings to remove loose dust. In worst cases, you can remove a few more screws from the power supply box and lift off its cover for a thorough internal vacuuming. Clean the propeller of the fan while you're at it, if you open the box. All this stuff is standard, so don't worry about it. Just do it.

Power supplies have standard output cables with three distinct types of wire bundles and connectors. (See Figure 3) Two of these bundles have six wires each, and terminate in identical plastic female connectors. The wires of one bundle are color coded orange-red-yellow-blue-black-black, while the wires of the other bundle are color coded black-black-white-red-red-red.

These two bundles are designed to connect to twelve mating pins on the motherboard, and you really can't make a mistake if you get it in your head that the black wires are oriented in the middle of the row of 12; not at the ends of the row. This combination plugs onto the motherboard one way only. The other way will not fit. Black wires are ground. Red and orange wires = +5v. White wires = -5v; yellow = +12v. Blue = -12v.

There are two common types of 4-wire bundles and female connectors for mating to devices such as CD-ROMs, floppy disk drives; and hard drives. Each wire bundle is coded red-black-black-yellow, with one type terminating in a larger connector than the other. The two types of connectors cover most all power connector requirements of disk drives and other bolt-on devices. Power supplies typically have three or more of the 4-wire bundles with the larger connectors and at least one 4-wire bundle with the smaller connector. Newer 3-1/2" floppy disk drives use the smaller connector, while CD-ROMs, 5-1/4", and hard drives use the larger connectors. Physically, the two differ; but they're the same electrically. Each of these 4-wire bundles terminate in polarized connectors so they can't be plugged in backwards.

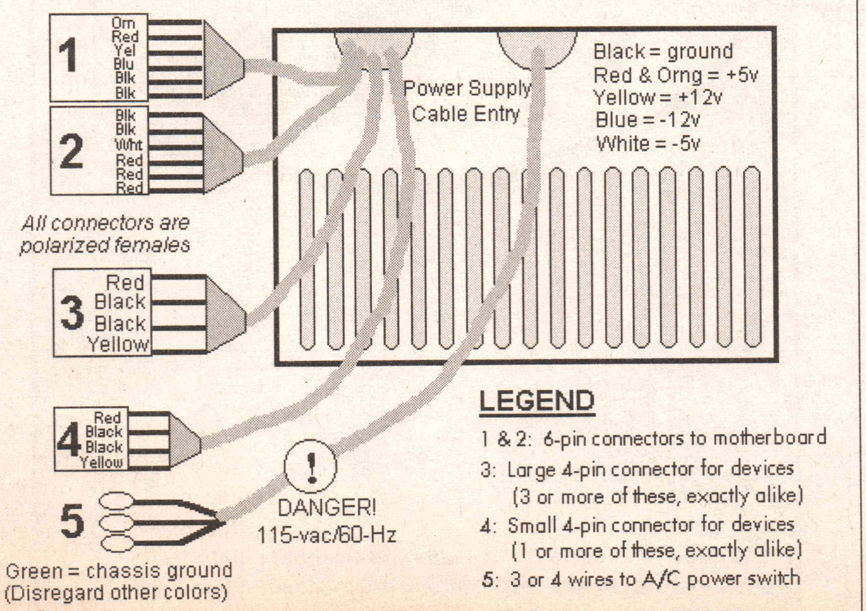
Next month, we'll conclude the familiarity guide and get started with upgrade and construction techniques. Please keep this article for reference as we move along. We won't have the space to repeat the diagrams.

■ Contest Time

Remember my offer for the next eight months: submit an idea or a project for this column and if selected, you'll receive an autographed copy of my latest book, *The Ultimate Scanner*.

FIGURE 3: Power Supply Wire I.D.

Correct positions of 1 & 2 as shown


1
Orn
Red
Yel
Blu
Blk
Blk
2
Blk
Blk
Wht
Red
Red
Red
All connectors are polarized females
3
Red
Black
Black
Yellow
4
Red
Black
Black
Yellow
5
Green = chassis ground
(Disregard other colors)
Power Supply
Cable Entry
Black = ground
Red & Orng = +5v
Yellow = +12v
Blue = -12v
White = -5v
!
DANGER!
115-vac/60-Hz
LEGEND
1 & 2: 6-pin connectors to motherboard
3: Large 4-pin connector for devices
(3 or more of these, exactly alike)
4: Small 4-pin connector for devices
(1 or more of these, exactly alike)
5: 3 or 4 wires to A/C power switch

ANTENNA TOPICS

BUYING, BUILDING AND UNDERSTANDING ANTENNAS

W. Clem Small, KR6A, CET

A Useful, Small, Tunable Loop Antenna

A Review of the AEA IsoLoop®

Probably most of us have at times wished for a small HF antenna with gain comparable to a full-size HF dipole, and yet of a size that would easily mount in a closet, attic, or other small area. Well, small-loop antenna technology can supply just such an antenna. These small loops do yeoman service in various applications such as sites where there is not space for a larger antenna, and in situations where you want to be able to install and remove the antenna quickly, as on field day, on a boat or mobile home, or for vacation operating.

Let's take a look at a representative model of this kind of loop and get an idea of both their virtues and their less-favorable features.

▪ The AEA IsoLoop 10-30

The AEA IsoLoop (fig. 1) looks and feels remarkably different from any antenna most of us have used before, and it is. It consists basically of a high-Q (high selectivity), single-turn, loop inductor 35 inches in diameter. A plastic housing contains a high-Q tuning capacitor with a stepper motor and controller which enables you to tune the antenna to resonance from your operating position.

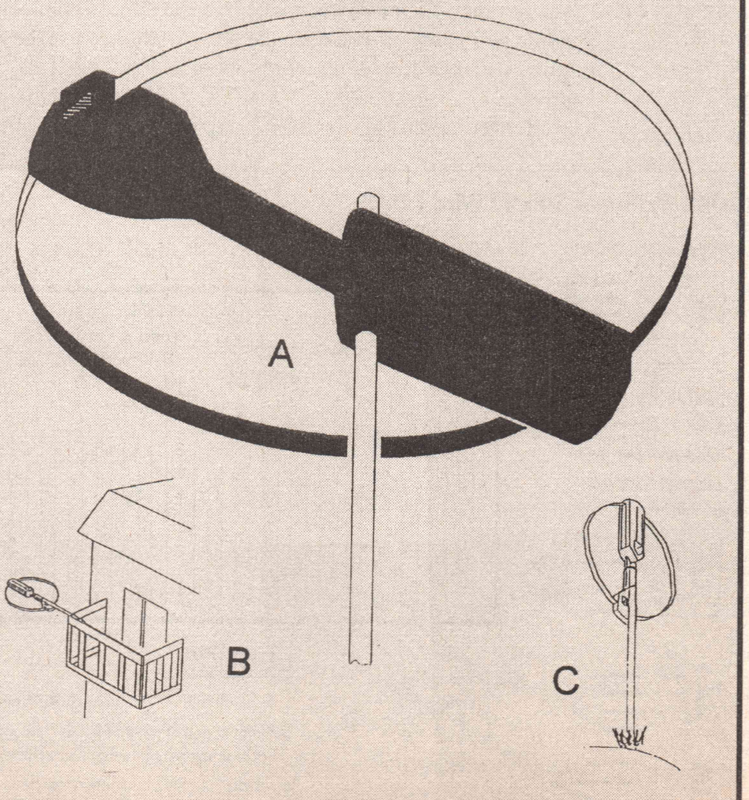
The loop can be oriented horizontally (fig. 1A and 1B), which yields horizontal polarization and a good non-directional radiation-reception pattern. When mounted vertically (fig. 1C) it has vertical polarization and two nulls perpendicular to the loop; the nulls are useful for nulling-out interference coming from fixed directions.

Frequency coverage is from 10 MHz to 30 MHz with a nominal feedpoint impedance of 50 ohms and a power rating of 150 watts. Its weight is 14 lbs (6.35 kg)—very significantly heavier than a wire halfwave dipole.

The antenna must be tuned quite precisely to the desired frequency of operation because its bandwidth is quite narrow—approximately 10 to 100 kHz depending upon the tuning range in which it is operating. For receiving purposes this narrow bandwidth helps prevent interference from signals near the frequency to which the loop is tuned, and makes receiver overload and intermodulation distortion (IMD) much less likely. When transmitting, the narrow bandwidth helps keep your signal cleaner and reduces TVI.

The other side of the coin is that, with such narrow bandwidth, all but very small changes in operating frequency require that the antenna be retuned. Tuning is accomplished by operating two switches and two knobs on the antenna's controller, while listening for maximum received noise (or maximum signal) or watching for maximum indication from an LED level indicator on the controller.

FIGURE 1



The AEA IsoLoop 10-30 (A), alternate horizontal polarization mounting (B), mounted for vertical polarization (C).

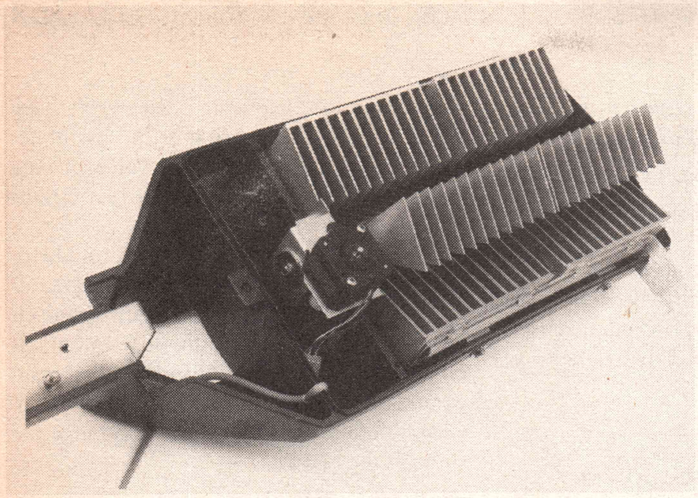
▪ Using the IsoLoop 10-30

The instruction manual told me that the IsoLoop would perform "quite efficiently" at 10 to 15 feet above ground, and it did. Incidentally, at low mounting heights, this antenna is said to have considerably better low-angle radiation (DX) than a halfwave dipole at the same height, and this seemed to be true of my installation. I mounted the loop horizontally about 12 feet above ground and erected a halfwave dipole for 20 meters at the same height nearby for comparison. I compared the loop to the dipole during both monitoring and communications with other ham operators.

The technical specifications accompanying the IsoLoop 10-30 claim that SWR can be adjusted to less than 1.5:1 if there are no nearby obstructions; my loop was about 25 feet from a single story building with a metal roof, and its SWR ran about 3:1. The dipole's SWR was about the same, and so for this comparison I did not need to try reducing the loop's SWR as suggested in the manual.

As the IsoLoop's instruction manual correctly points out, the antenna's performance is much more sensitive to its being properly tuned than it is to a less-than-optimum SWR. On the other hand, many transceivers will reduce power output as SWR rises. You might think that you could reduce high SWRs by adding an antenna tuner. However, using an antenna tuner with the IsoLoop creates serious problems with tuning the antenna itself: don't do it.

Tuning the IsoLoop is a



AEA IsoLoop antenna with case off and large capacitor

relatively demanding process and requires patience to learn; once you learn, it is still tedious. The bothersome and frequent need for retuning whenever the operating frequency is changed is an important factor; it is probably the only significant downside of this antenna.

Let me clarify that this is not a reason to avoid the antenna—it is a price you pay for having a good performer in such a small package. I found that tuning was often easier if I used a technique suggested by Bill Fawns, KE6HEZ. Bill's technique consists of connecting the loop's feedline to an MFJ-259 SWR Analyzer (*see DeMaw's Workbench in this issue*) and tuning the antenna for minimum SWR.

In the same vein, AEA offers the optional IT-1 Automatic Tuner to ease the burden of tuning. The IT-1 tunes for minimum SWR or maximum noise. Although I have not reviewed this unit I expect that it would make tuning the IsoLoop 10-30 much easier.

Ye Olde Bottom Line

In actual operation I found that the signal output of the IsoLoop compared surprisingly well to that of the halfwave dipole. Much of the time the dipole was somewhat better, but the IsoLoop was frequently better than the dipole; often they were about equal. It was necessary to tune the IsoLoop very carefully or it would appear to be quite inferior to the comparison antenna, even though retuning was all it required.

If you have space to put up a full-sized, halfwave dipole; if you don't need continuous coverage from 10 to 30 MHz; or you don't need to move the antenna around from place to place often, then you probably don't want or need a small, high-Q, tuned loop. On the other hand, if you have very limited space for putting up antennas; if you can't put up outside antennas, but have attic space or crawl space for one; if you want an antenna that is continuously tunable from 10 to 30 MHz with a choice of a good all-around horizontal radiation and reception pattern (horizontally polarized), or one with two nulls (vertically polarized); or, if you want an easily-mounted (though a bit heavy) antenna, then you may want to consider an antenna like the AEA IsoLoop 10-30.

The IsoLoop 10-30 and IT-1 automatic tuner are made by Advanced Electronic Applications Inc., PO Box C2160, 2006-196th St., SW Lynnwood, WA 98036. Literature request line 800-432-8873.

RADIO RIDDLES

Last month :

Our riddle was: "What world-famous tower was saved by radio?"

Well, my "Paris correspondent" informs me that mounted somewhere on the Eiffel tower there is a plaque which explains that during the first World War the tower was scheduled to be destroyed by the French themselves. Then a radio operator found that the tower was the only location from which he could hear German military radio messages with enough strength to read them; thus the tower was spared. Wouldn't most of us just love to put our monitoring station's antenna on top of such a tall tower!

This month:

The folks who study such things are saying that we are at the bottom of the 11-year sunspot cycle. Just what is this cycle, and what does it have to do with propagation of the signals our antennas send and receive? And why are hams who like to work 10 and 15 meter DX, and CBers who like that illegal CB (11 meters) DX glad to hear that the cycle is about to take an upswing?

Get the answer to this riddle and much more in your next issue of *Monitoring Times*. 'Til then, peace, DX, and 73.

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ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

Q. *Why do publishers who review new scanners not mention whether or not the memory banks can be linked together? For example, if I need more than 20 channels at a time to track a trunking system, and my scanner has ten banks of 20 channels, I need to know whether I can link banks so I can handle the capacity.(James MacDonald, Derry, NH)*

A. All scanners can link their channel banks to allow consecutive scanning of their full capacity.

Q. *I recently heard both sides of a cordless or cellular phone call on 27.045 MHz (CB). How is that possible? (Mike Elcsisin, Lake Berryessa, CA)*

A. Easy. Some local CBer was holding his mike next to his scanner tuned to the cordless or cellular phone frequency.

Q. *Where can I buy a multi-outlet, multi-voltage AC adaptor that will allow me to operate several accessories simultaneously without having to have a separate wall adaptor for each? (Hugh Waters, Singapore)*

A. I think the answer is, you can't. I've never seen one, and the cost for such a specialized piece of equipment would exceed the cost of buying several separate, widely-available AC adaptors.

Q. *Can a scanner pick up the transmissions from an automatic car door opener on a key ring? How about the Lojack automatic vehicle tracking system? (Don Megguier, Shirley, MA)*

A. Yes on both accounts. The key rings are found slightly above 300 MHz, while Lojack's stolen car alarm calls for help on 173.075 MHz.

Q. *Is it possible to use a computer to decode digitally-encrypted communications? When APCO's Project 25 is implemented in a few years, will all communications be encrypted? (Tom Rossi, Yonkers, NY)*

A. In our entire publishing history, we have never heard a confirmation of successful decoding of digitally-encrypted voice or data using the most common high-level systems like Motorola's DVP or DES.

While APCO's Project 25 does provide for encryption, it is foremost a means of standardization and efficient spectrum utilization. It provides for several levels of digitization, including encryption, but it is not likely that all communications will switch to encryption. Cost, reliability, maintenance, and range are some of the reasons.

Q. *Why doesn't someone make a scanner with a function that resumes scanning as soon as the voices stop talking rather than waiting until the carrier drops out several seconds later from the repeater? (Numerous requests)*

A. Virtually all scanners use carrier-activated squelch, by which the scanning sequence continues until a radio signal is detected (whether or not there is modulation present), remains locked on that channel until 2-3 seconds after the signal drops out, then resumes scanning.

If scanning resumed as soon as a voice stopped talking, the listener could miss a re-

Bob's Tips of the Month

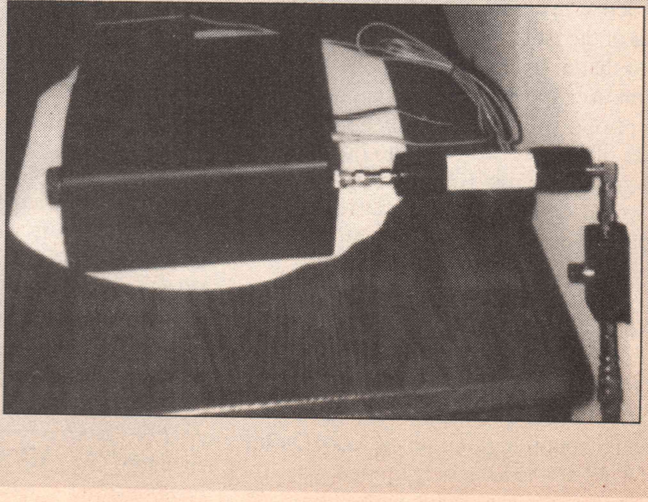
Reducing Scanner Intermod

Strong-signal overload and its attendent intermodulation (intermod) comprise the leading complaint among today's scanner users. Since Robert Hofer of St. Paul, Minnesota, is using the now-discontinued Uniden BC-8500XLT, which is especially vulnerable to intermod, he decided to do something about it.

Connecting the Grove FTR-5 Scanner filter (to reduce problems from high-powered TV and FM broadcast stations) in series with the adjustable Grove ATT-1 attenuator, he can now select just the right level of signal reduction without compromising sensitivity.

Although the Scanner Filter can be connected directly to the scanner antenna jack as shown, it does force the radio forward; a small piece of coax between them, equipped with a BNC and an F connector, will allow the radio to be pushed farther toward the rear.

Robert is pleased to report that the combination has worked perfectly for the past month since he installed it.



Questions or tips sent to "Ask Bob," c/o *MT*, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of *MT*.

ply, or even the rest of a transmission if the sender simply paused without releasing the mike button.

Nonetheless, this is an interesting question. Would scanner listeners find such an option desirable?

Q. *Is there anything I can't answer? (Bob Grove, Brasstown, NC)*

A. Yeah. Here's one: Is static electricity or a nearby transmitter more likely to burn out a receiver's front-end (RF) transistor when the radio is on or off, and why? Would you technical types enjoy a few brain teasers now and then to try to solve? Send in questions, with or without answers, and we'll try a few just for fun.

Q. *Why are Q multipliers and antenna trimmers no longer used in modern receivers? (Richard R. Dailey, Pittsburgh, PA)*

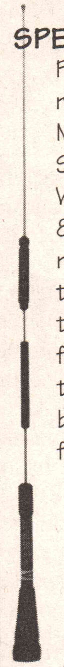
A. "Q" or "quality factor" refers to the sharp selectivity of a tuned circuit. A tuned circuit attached to an amplifier which has feedback will oscillate, but if the feedback is reduced just below the point of oscillation, selectivity is extremely sharp. This is the technique used in the Q multiplier of the Hammarlund days. Nowadays, selectivity is achieved by using well-designed filters and digital signal processing (DSP).

Antenna trimmers were tunable capacitors connected to the antenna circuit as a sort of "poor man's antenna tuner," an effort to resonate the overly-long wire antenna at the tuned frequency of the receiver. This provided somewhat-improved signal strengths for poor-sensitivity receivers, and some reduction in off-frequency, strong-signal overload images, and intermodulation. Modern designs utilize input filtering, higher sensitivity, and better dynamic range, making the antenna trimmer unnecessary.

Q. *What frequencies are used by private helicopter companies? (Tom Rossi, Yonkers, NY)*

A. Naturally, they utilize the same airport tower frequencies as other aircraft (118-137 MHz AM), but in addition they may share frequencies used by land mobile services with which they are working. For example, helicopter support of dam construction projects, petroleum exploration teams, traffic and news reporting teams, and others find it necessary to share their frequencies for coordination.

King of the Hill



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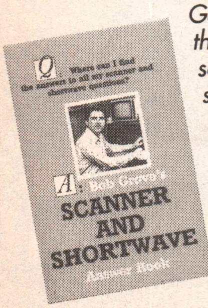
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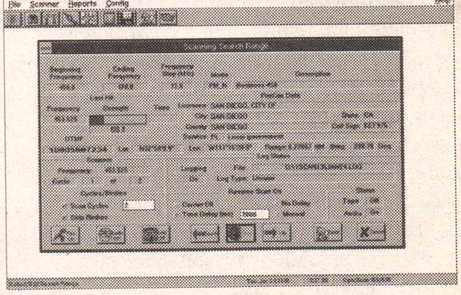

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(Continued from Page 4)

information was provided to you based on my recall of High School history.)

"I would like to congratulate you and your magazine on its great work. It has been a highlight for me each month almost since you began publishing."

Internet Phone

■ Gary Wentz KC4EHT, says, "I hereby accuse Bob Grove of ESP in his editorial concerning the joys of internet phone. In the August issue of *Florida Skip*, I wrote an article entitled 'Ham Radio QSOs on Internet' without broaching the subject of internet phone, but more along the lines in Internet Relay Chat (IRC). I intended to present the voice aspect in October—or as soon as I read more on the technical aspects of internet phone. Although I didn't indicate it to my readers, I too felt the elation (on IRC) of exploring the outer reaches of the world, free of many of the constraints of amateur radio.

"You so correctly described amateur packet radio in an editorial several months ago, and I am one of many disgusted local leaders in packet who have abandoned packet in the area. The local LAN is a haven for keyboarders who operate by standards that make them 'feel good'; usually by profanity, ridicule of serious operators, and continuing discussions about the unreasonable CW requirement. Many of them brag about their operating on HF in spite of their license class."

We also received a letter from Fred Lehman WD8MGO, who agreed that ham radio's "enemies" are not from SWLing, freebanding, scanning, GMRS, CB, or Internet, but they are from amateur radio's own rank and file. He also feels that instruction to new amateur operators has failed to communicate that operation on any ham band is not a *right*, but a *privilege*.

The above letters differ somewhat from the first ones we received (see Oct "Letters"), which were almost unanimous in their praise of amateur radio. Bob Grove responds to the positive experiences expressed last month by saying, "If ham radio is to be kept alive, its vitality will be provided by stalwart, principled individuals like these."

Digital vs. Analog

■ Alan Scharf, P.Eng., CMC, writes us from Saskatoon, Saskatchewan, to dispute a statement Bob Grove made in his August "Ask Bob" column. Says Alan, "You claim concerning analog dials, that 'modern digital technology is infinitely superior in performance' is just plain wrong.

"I keep my trusty and ancient $100 Sony ICF4900 by my Drake at all times as a spotting scope. I can scan the entire (mostly) shortwave band from 5850 to 21900 in less than 30 seconds. I can find the stations that are coming in well and identify which frequencies are 'hot.' And I can do it all visually. Try that on your so-called superior digital dialers. Without this wonderful little analog device by my side my R8 would be pretty useless.

"I personally would love to buy a Yacht Boy if it only had a proper dial and tuning knob. Eat your words."

Bob says he stands by his original assessment. He explains, "Reader Scharf's retort has nothing to do with analog or digital tuning. Low-end digital portables lack dials because pushbuttons are smaller and cheaper, not because they are digital. While Mr. Scharf lauds the fast tuning speed of his old analog-dial Sony ICF-4900, once he finds a signal he switches to his digital Drake for listening. If the analog Sony is so much better, why switch?

"Analog tuning with its slide-rule dial cannot begin to compare to digitally-synthesized frequency stability or readout accuracy, nor can the best analog filters compete with the selectivity of digital signal processing (DSP)."

Pictures from Portugal

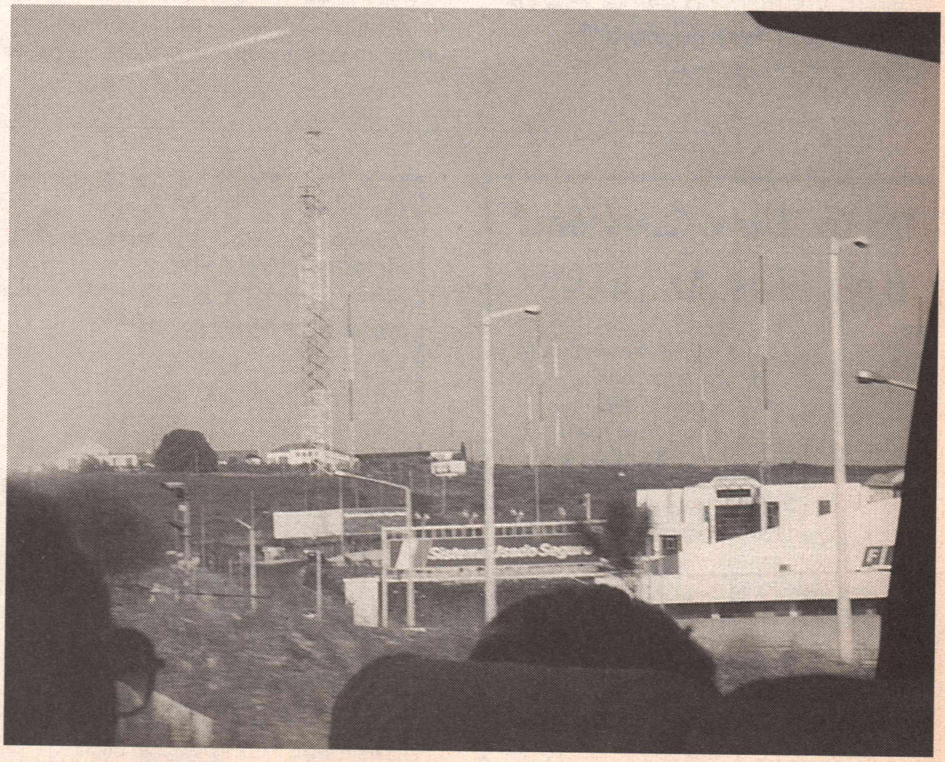
■ Most of us do our traveling by radio, but Gigi Lytle of Lubbock, Texas, is one lucky radio listener who has gotten to meet several broadcasters face to face. Last year she traveled to China; this year she took a tour of Radio Portugal's facilities. She reports, "I was able to observe a live broadcast in the Timiri language. Radio Portugal is in the process of moving to a new building in a business district. I had lunch with Winnie Almeida and Barry Gardner and took Winnie a copy of *MT*.

"Winnie says letters from women is increasing. We discussed the usual—staff cuts, frequency problems, increased postage rates, etc."

Out of the bus window, Gigi caught the accompanying photo of the Radio Portugal antenna farm as they left Lisbon on the road to Sintra.

Maybe you haven't had the good fortune to visit a utility or shortwave broadcast station, public safety agency, or other favorite listening target, but isn't there some hardworking staff that has brought you hours of enjoyment?; perhaps has even sent you letters or souvenirs? Thanksgiving is the perfect excuse to write and tell them "Thanks" for the great monitoring times.

— Rachel Baughn, Editor



Radio Portugal antenna farm as shot out of a bus window near Lisbon, Portugal.

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All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. U.S. northeast of the Mississippi; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. $18 U.S, $21 Can/Mex, $28 ww. $3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine.*SWL*.$20 US, $22 Can/Mex. $1 sample ($2 ww). Meets1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* $18 US, $19 Can/Mex, $25 ww.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. $2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. $25 US, $2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). $17.50 or $29.90, $5 more Can. $3 sample.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, The Lexington Club, Rte 4/225 1/4 mi W of Rte 128.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger.* $26 Can, $25 US, $US28 or $Can35 ww. $2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. $8. Meets irregularly.

Central Florida Listeners Group: Andy Fountain KD4OKJ, (407)898-6784. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. $17, $1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter.* Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington N0NNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Longwave, shortwave. *Colorado Shortwave Listener* (4x) 35 cents each, or Internet nonni@filebank.com. Meetings cancelled remainder of '95.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908)591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania.* $10 US, $11 Can/Mex, $16 Eur, $17.50 Asia/Pac.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpage@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35126-1176; Internet: XYVD51A@Prodigy.Com. Worldwide; all bands. *Radio Waves* (bi-monthly). $1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter.* Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor.*

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831. Worldwide; BCB/AM DX. *DX Monitor (34 x)* $25 US, $27 Can/Mex, $28.50 ww. First-class stamp or 2 IRCs for sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown.* $18 US, $19 Can/Mex, $26 ww.

Listeners' Nets

You are invited to post your North American amateur radio net in this bi-monthly listing if its primary emphasis is devoted to the radio monitoring hobby (not amateur radio).

Capitol Hill Monitors
146.91 MHz 1st & 3rd Mon 7:30pm ET, DC, Md, N.Va, S.Del; Scanning and amateur radio Frequency Forum BBS 703-207-9622 [8-N-1]
Net Mgr: N3RDC, John Korman
Call Alan Henney 301-270-2531 or John Korman 301-299-5455 for info
Newsletter $8; 6912 Prince George's Ave, Takoma Park, MD 20912-5414

Central Florida Listeners Group
146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands
Net Mgr: Andy Fountain, KD4OKJ
Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031
Call Andy Fountain, KD4OKJ, (407)898-6784 for info

Larkfield's ARC SW-Scanner Net
147.210 MHz, Fri 8pm ET, Long Island, NYC, NJ, Conn; Shortwave BCers & utes, MW, amateur radio, scanning
Net Mgr: Hank Lukas, N2GCN
Open to all amateurs on air; by letter for scanner listeners
Contact: P.O.Box 115, Plainview, NY 11803-0115

Listening Post
147.03, 224.96, 447.725 (W3DID/R), Sun 8pm, Baltimore and metro area; non-amateur transmissions DC to Daylight except ECPA-related items or tacticals
Net Mgr: Mike Agner KA3JJZ
Open to all amateurs on air; by maildrop at: 6710-F Ritchie Hwy #236, Glen Burnie, MD 21060.
Packet: KA3JJZ @ WB3FFV.md.ena.usa

Montreal DX Listeners Net
146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner
Net Mgr: Sheldon Harvey VE2SHW
Telephone gateways announced

Monitoring the Long Island Sounds Net
146.805 Tues 8pm ET, Long Island, NY; Primarily scanning
Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net
146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band
Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls)
Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association
146.880 Mon 9pm ET, NYC area; "DC to Light"
Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736
Voice mail 1/2 hr before net: 212-978-3375; Compuserve 73167,312

Northeast SW Listeners and Scanners Net; Rip Van Winkle Society
147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.
Net Mgr: Ray Loeper N2RAD

Ontario DX Association - Listeners Net
442.375+ (VA3ODX; 103.4Hz CTCSS tone), Sun 8:30pm ET; Toronto area coverage; LW, MW, SW, FM, VHF/UHF topics discussed
Net Mgr: Stephen Canney, VA3ID
Open to all; repeater used daily by ODXA members

Rocky Mountain Monitoring Net
147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring
Brian Gould, KB0MEP, Mt. News Net

Shortwave Listeners Net, Association of North American Radio Clubs
7.240 MHz LSB, Sun 10am ET, Eastern US; Shortwave broadcasts and utilities
Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446
Telephone gateways announced

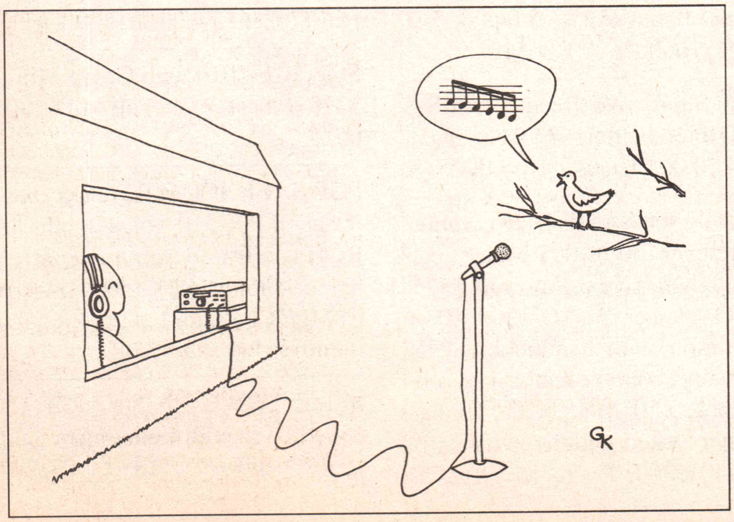
Southern Wisconsin SW Listeners Net; MARA
147.150 MHz, alt 146.760 MHz. Madison, WI, area
First Sun 8pm CT. Shortwave, scanning, dc to daylight, equipment notes and comments.
Net Mgrs: N9LTD, KA9SRU, N9EWO
Contact: N9EWO, Dave Zantow, 1609 Ontario Drive, Janesville, WI 53545

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Nov 4	Mobile, AL	Mobile ARC / Richard Ireland KD4TTD, 10341 Hwy 188, Grand Bay, AL 36541, 334-824-2749
Nov 4	Eustis, FL	Lake ARA / Tim Morrison KE4RVO, 104 Oklahoma Av, Leesburg, FL 34748, 904-728-1910
Nov 4	Godfrey, IL	Lewis & Clark Radio Club / Harold Elmore KC9GL, 5203 Dixon Dr, Godfrey, IL 62035, 618-466-1909
Nov 4-5	Odessa, TX	West Texas Amateur Radio Club Odessa Hamfest / Robert Jordan N5RKN, 915-335-7980, e-mail rjordan903@aol.com, Ector County Coliseum Exhibit Bldg B, Sat 8am-5pm, Sun 9am-2pm, Adm $7
Nov 4-5	Lawrenceville, GA	Alford Memorial Radio Club Hamfest 95 & Computer Expo / Ed Honeycutt WA4VFH, PO Box 1282, Stone Mtn, GA 30086-1282, 404-410-3989, Gwinnett County Fair Grounds, Sat 9am-5pm, Sun 9am-3:30pm
Nov 5	Massillon, OH	Massillon ARC / Jack Cale, N8FEB, 6021 Longbrook St., SW, Massillon, OH 44646, 216-477-8261
Nov 11	Montgomery, AL	Montgomery ARC / Tim Moore KK4TK, 180 Grass Farm Rd., Titus, AL 36080, 334-567-9752
Nov 11	Titusville, FL	Titusville ARC / Cliff Hoag KC4SYD, 2670 Hutchison Pl, Titusville, FL 32780-4836, 407-267-7030
Nov 11	West Monroe, LA	Twin City Ham Club / Lynn Tiller, 2907 Fort Miro, Monroe, LA 71201, 318-322-3129
Nov 11	Myrtle Beach, SC	Grand Strand ARC / David Berry KE4OOW, 100 Longwood Ln, Conway, SC 29527, 803-248-9401, Myrtle Beach High School, Central Drive between 29th and 38th Aves, N, 9am-4pm, Adm $6
Nov 12	Macomb, IL	Lamoine Emergency ARC / Kathy Page AA9KL, 580 West Penn, Roseville, IL 61473, 309-426-2723
Nov 18-19	Ft. Wayne, IN	Indiana State Convention / Don Gagnon WB8HQS, 2805 Nordholme Av, Ft. Wayne, IN 46805, 219-484-3317
Nov 18-19	Tampa, FL	Florida State Convention Annual Suncoast Amateur Amateur Radio and Computer Convention/ Charlotte Frazier WB4PEL, 617 Highland Av, Dunedin, FL 34698, 813-733-6937, Location: Florida Expo Park, Expo Hall, I-4 & US-301, Talk-in 146.94-, Sat 9am-5pm, Sun 9am-3pm, Adm $6
Nov 19	Benson, NC	Johnston ARS / William Lambert AK4H, 8917 NC Hwy 50 N, Benson, NC 27504, 919-894-3352
Nov 19	Washington, PA	Washington Amateur Communications Tri-State Hamfest and Computer Fair / Ted Lockman WB3BZK, 412-222-6473, Chartiers-Houston High School, take I-79 Exit 8, south of Pittsburgh, at exit follow Racetrack Road West to stop light, turn right, one mile north on Pike Street. Talk-in W3CYO/R 145.49-, 8am-3pm, Adm $2
Nov 25	Litchfield, IL	Central Illinois/St Louis Area Amateur Television Club / Scott Millick, K9SM, 907 Big Four Av, Hillsboro, IL 62049-1009, 217-532-3837
Nov 25	Evansville, IN	Electronic Applications Radio Service / Neil Rapp WB9VPG, 1506 South Parker Dr, Evansville, IN 47714, 812-479-5741

Monitoring Times is happy to run brief announcements of radio events open to our readers. Sendyour announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar
P.O. Box 98, Brasstown, NC 28902-0098



Big Ralph's main love was monitoring whistlers in the 10kHz(VLF) band.

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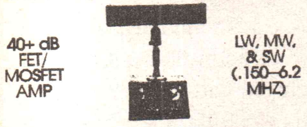

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CLOSING COMMENTS

Bob Grove
Publisher

The FCC: Is it Worth Saving?

With the Senate majority continuing to press for reduced government spending, the Federal Communications Commission has been hit, and hit hard. Like most government agencies, the FCC probably has waste; as with any government-budgeted organization, it must spend its allotment or face the risk of reduced allocation. This inflationary survival procedure is bound to raise eyebrows during a period of fiscal scrutiny.

With an anti-government mood in Congress and throughout the electorate, do we really need the FCC? Can we get by with a drastically-scaled-back agency? Should we disband the Commission, turning over litigation to the courts and regulation to the private sector as proposed by members of Congress? The FCC admits that they can respond to only a tiny fraction of the 25,000 interference complaints they receive each year.

Most of us are familiar only with the radio regulation aspects of the Commission, grudgingly recalling their role in the listening-restrictive Electronic Communications Privacy Act of 1986 (ECPA '86) and the anti-cellular-scanner prohibition of 1993.

But it was Congress, not the Commission, who enacted these measures. The FCC was merely following the mandates of our elected officials. Let's not shoot the messenger.

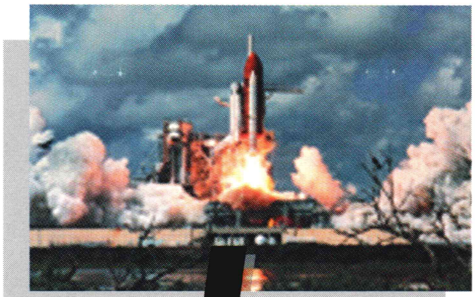
The FCC was created in 1934 along with the historic and formative Communications Act which, with unusual visionary wisdom, noted that people were going to listen in if a signal was there, so it was reasonable to caution them not to divulge communications they overhear. That made sense for half a century until cellular telephone interests found it commercially expedient to limit Americans' freedom of the airwaves so that cellular providers could ignore their moral obligation to protect their customers' privacy.

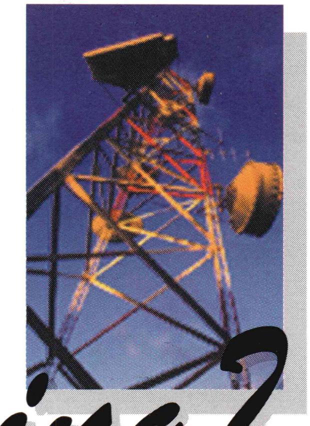
The Commission gave up long ago on enforcement of CB, ham radio, and many other services, so what good is it? For one thing, they are a pool of experts in the field of electronic communications, with a girth of experience and insight. To abolish this team and turn over their responsibilities to the private sector would be chaotic at the least, and probably self-destructive as well, with self-serving interests buying rights away from less affluent license seekers—or even present licensees.

Magnate corporations are already buying the spectrum; their influences on the private sector are bound to mold the destiny of telecommunications and, in the absence of government regulation, their monopolization of the spectrum is inevitable.

The draining of FCC resources has already begun: bureaus have restructured or merged; nine field offices will be closed within months, including the vigorous Norfolk office whose aggressive enforcement of illegal CB radios and computers was exemplary. Hundreds of workers are being axed and the extensive FCC monitoring network is being closed down and remote-controlled from Laurel, Maryland.

Some feel that the FCC is a dinosaur, that, like many agencies, has become too big and decentralized to be efficient. Yet its destruction could well herald the destruction of democratic telecommunications—a public asset—and its subsequent domination by special interests. The FCC may need to be downsized for budgetary restraints, but not emasculated. We need it.





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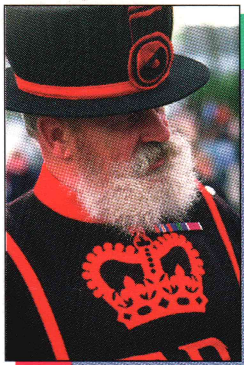

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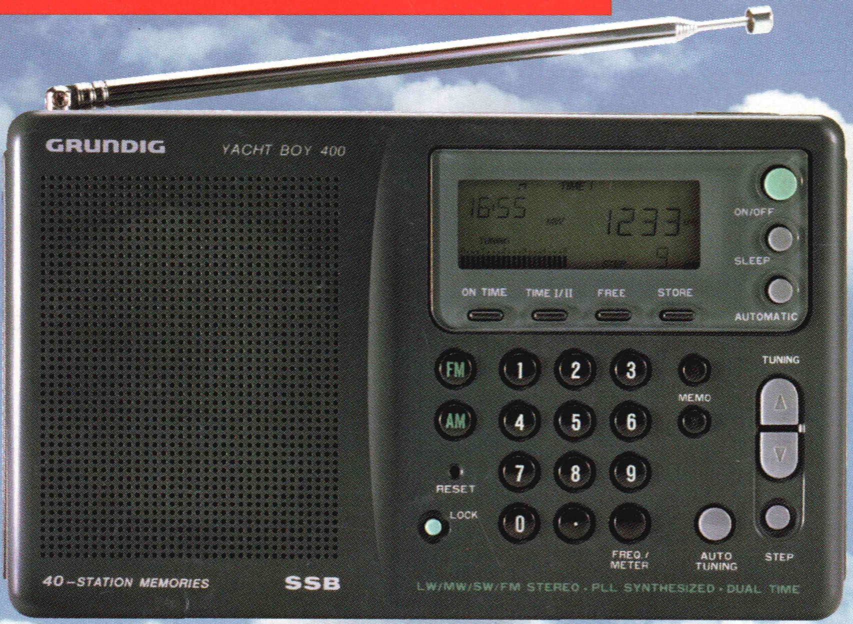
GRUNDIG
YACHT BOY 400
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SLEEP
AUTOMATIC
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STORE
TUNING
MEMO
FM
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RESET
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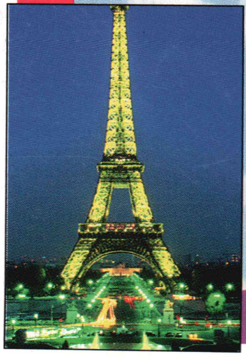

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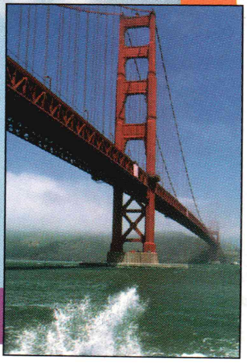Call for information: U.S. 1-800-872-2228 or 415-361-1611
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